



Practical Teaching in Emergency Medicine

EDITED BY

Robert L. Rogers

Amal Mattu, Michael E. Winters,
Joseph P. Martinez & Terrence M. Mulligan

SECOND EDITION



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Practical Teaching in Emergency Medicine

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Edited by

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First and foremost, this book is dedicated to my beautiful wife, Tricia, and my two wonderful children, Harrison and Gabriella. Without their love, guidance, and constant support, this book would not have been possible. Family comes first.

I dedicate this book to all of the educators of emergency medicine in USA and around the world: may this book inspire you to educate how to teach our craft and deliver the best patient care possible.

To the emergency medicine residents and students at the University of Maryland: you are the reason I drive to work with energy and enthusiasm for teaching.

I would like to thank my mom and dad for their encouragement and love throughout life. I am where I am today because of them.

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Rob L. Rogers

My thanks to my family for their constant support; my colleagues, residents, and students for their inspiration to teach and to learn; and to all those who spend their time teaching emergency medicine around the world ... may your efforts continue to help our specialty flourish.

Amal Mattu

To the medical students and emergency medicine residents at the University of Maryland for making me look forward to my shifts and to Lisa, Nicholas, Dylan, and Luke for making me happy to go home.

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Michael E. Winters

I am very excited to be involved as coeditor for the second edition of *Practical Teaching in Emergency Medicine*. My involvement stems from the enormous interest and growth of emergency medicine education, practice and development in the international setting, and from the demand to share the contents of this book with the international emergency medicine community. I would like to offer my deepest thanks to my coeditors, especially Rob Rogers, without whom this material would most likely still reside in the collective minds of our teachers instead of in a book form. I would also like to thank my beautiful wife Kristina without whom I would not be able to do most anything.

Terrence M. Mulligan

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Preface

Considering the success of the first edition of this book, I wondered what important elements could or should be added to the second edition to make it even better. The first edition is already very comprehensive and useful for the physician who wants to become a better educator and learn the skills necessary to teach emergency medicine. So, what could be added to make the book even better? Well, to make sure the book addresses the needs of physician–educators from all over the world, chapters on lecturing to an international audience, using simulation as a teaching tool, how to make journal club work for you, and many other topics were added to the book. Each chapter was updated and reviewed to make sure the content was something that emergency physician–educators could use in any country. This edition is even better than the first, and we sincerely hope that it helps you in your mission as an educator in one of the best specialties in the house of medicine.

The emergency department (ED) is one of the most interesting and rewarding teaching venues in the house of medicine. No other environment offers such a rich blend of undifferentiated patient presentations and diseases. However, because of this diversity, the ED is also one of the most difficult places to teach. Many of our patients are desperately ill, and we must often reset our priorities quickly to meet their clinical demands. In this environment, emergency medicine educators are challenged to provide quality education for medical students and physicians-in-training.

Emergency medicine attendings who wish to hone their teaching skills can find a number of textbooks on educational strategies written by physicians from other disciplines. However, until now, they have not had access to a text written by emergency medicine physicians on methods of teaching that are directly applicable to our specialty. This book was compiled to meet that need. Its purpose is to provide educators in emergency medicine with a resource on best practices in teaching the art of emergency medicine. The contents are organized around the topics of teaching specific groups of learners, teaching in the ED, improving as an educator in emergency medicine, and appreciating various teaching techniques and strategies.

The chapter contributors are widely regarded as leaders in the field of emergency medicine education and faculty development. Authors were given free rein to develop their chapters and write in their own style. They were asked to present their personal views on how to successfully teach the art of emergency medicine rather than review evidence-based guidelines regarding medical education. As a result, most of the chapters have few references. This first-person approach to a multiauthored textbook yields a compilation that varies in style from chapter to chapter and exposes the reader to a variety of communication techniques. The editors hope that readers find useful models within these pages as they refine their own methods for teaching in the spectrum of venues where emergency medicine is taught.

Inherent in the teaching and the practice of emergency medicine are specific challenges not found in other specialties—the unknowns of the ED, the need to identify life- and limb-threatening conditions, the pressure to solve problems and find solutions quickly, and the orchestration of clinical specialists and ancillary services. Because of these unique demands of our practice, books written by clinicians from other disciplines may be helpful but not complete for us. *Practical Teaching in Emergency Medicine* was written by emergency medicine physicians for emergency medicine physicians. We hope you find the second edition to be a valuable resource toward teaching the art of practicing our beloved specialty.

SECTION 1

Background/Introduction

CHAPTER 1

Adult learners in the emergency department

Ellen J. O'Connell and Kurt C. Kleinschmidt

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Learning begins before birth and continues to death. Notably, the process of learning changes throughout life. Children study topics because an authority figure dictates that they must. The child may argue the applicability of the topic to the “real world,” but ultimately the child must learn the material.

Adults seek to learn because of a motivation to do so. Adults seek experiences that have an identifiable impact on life. However, the motivation for adult learning is not always from within; external forces also affect motivation. Adults sometimes seek education, not because they are excited about the subject but because they know it is in their best interest. Adults seek learning so as to better interact with the real world. This is the difference between adult and childhood learning.

The purpose of this chapter is to explore the principles of adult education as they apply to teaching in the emergency department (ED). Examples of the principles will be applied to the ED setting. The terms *learner* and *physician-in-training* refer to anyone in the position of learning. A “teacher,” an “instructor,” or an “educator” is the person at any level of training who is in the teaching role.

Learning theories

There are three recognized classic learning theories: behaviorism, cognitive learning, and constructivism [1]. Each of these theories influences curriculum design, teaching, and evaluation. Most

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educators use elements from each theory in any given situation rather than strictly adhering to one style.

Behaviorism is the learning theory commonly associated with the Pavlovian response: a subject performs a behavior and receives a positive result, and the behavior is reinforced. If the result is negative then the behavior is discouraged and eventually eliminated. The behaviorist does not focus on the thought processes of the learner, but only on the response to a stimulus.

The cognitive learning theory is the opposite of behaviorism. It focuses on the learner's thought processes instead of a response to a stimulus. The interest is in how the learner integrates new information and applies it to new situations.

In constructivism, the learner builds, or constructs, new ideas based on existing knowledge. Constructivism focuses on how students interact and learn from each other as well as from their educators.

Learning as a child

Pedagogy refers to the learning style of children. Its literal translation from Greek is “to lead the child.” This is a teacher-centered style of learning. Because children are not thought to have sufficient experience to know what they need to learn, these decisions are made for them by their educators. Instructors decide on what material to teach and how to teach it. Young students generally have little choice as to the content of their curriculum. Decisions and information flow cent percent from the instructor to the student.

Aspects of the pedagogical style also apply to some adult learning situations. For example, during the preclinical years of medical school, adult students have little choice regarding content. However, unlike secondary school students, adults have chosen this curriculum because of their motivation to become physicians. The curriculum is a means to an identifiable end, providing motivation.

Learning as an adult

As the study of learning advanced, adult learning enthusiasts recognized that children and adults receive and process new information differently. This recognition suggested that adults should be taught differently, prompting radical changes in adult education in many institutions. In the mid-1950s, Malcolm Knowles began publishing his work on adult education, which, at the time, was an underexplored subject. He popularized the term *andragogy*, which he defined as “the art and science of helping adults learn.” He observed that adults need to be involved in their education rather than being “led”

to it. Childhood learning is teacher centered; adult learning is student centered. More on his theories is presented later in the chapter.

Pedagogical learning is based on discrete subjects: math, history, and spelling; or anatomy, cell biology, and pharmacology. This is appropriate for building lower levels of cognition, for the development of a foundation of knowledge. However, applying very basic knowledge, acquired in a pedagogical style, to real-world problems is more difficult.

Adult learning is more problem centered—an approach in which the learner pulls multiple bits of basic information from multiple, discrete subjects to solve a problem. Problem-centered learning is very relevant in the ED. For example, the ED physician, faced with a woman with right lower quadrant abdominal pain, simultaneously gives attention to all systems that may cause pain in this region. “Is this gastrointestinal (appendicitis, gastroenteritis), gynecologic (ectopic pregnancy, ovarian torsion, pelvic inflammatory disease), genitourinary (ureterolithiasis, pyelonephritis), vascular (aortic dissection), or something else (shingles)?” The clinician combines basic knowledge of these different systems and conditions with clinical experience to narrow the diagnostic possibilities and begin the appropriate evaluation.

Learning as an adult—Malcolm Knowles' theories and the arguments against them

Much of adult learning theory stems from five assumptions about adult learners that were developed by Knowles (Table 1.1). The assumptions reflect that adults are self-directed learners who seek information independently. They reconcile new information with their existing knowledge base and seek to apply it immediately to a known problem. It is important to note that these assumptions have not been validated.

Before embracing Knowles' theories blindly, one must note the many criticisms of his work. A commonly cited criticism was the

Table 1.1 Malcolm Knowles' assumptions about adult learning.

Adults are self-directed and autonomous
Adults have life experiences that need to be respected
Adults want to learn tasks related to everyday life
Adults are problem centered and seek to apply learned material immediately
Adults are motivated by internal drives rather than external factors

Adapted from [2] Kaufman DM. Applying educational theory in practice. BMJ 2003; 326: 213–216, with permission from BMJ Publishing Group Ltd.

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inadequate data used for the formulation of the assumptions is a commonly cited criticism [3–6]. This vacuum is of particular concern in today's culture of evidence-based practice.

Norman [3] questions at what point a student transitions from a child learning to an adult learning style. It is not likely an age-based phenomenon, as chronologic and mental ages are not always congruent. He suggests that the transition is not effected by an internal condition of the learner, but rather by a change in learning style, needed to meet a new pressure or situation.

Some suggest that the motivation for adult learning is rarely exclusively internal and that it often stems from external forces [4, 6]. Adults might acknowledge only their conscious internal motivation, neglecting a subconscious external motivation. For example, physicians must receive continuing medical education (CME) to maintain their certification. A physician may satisfy an internal drive to learn more about dental emergencies by attending a lecture on this topic at a conference; the external motivation of receiving CME credits is also satisfied.

The assumption that all adult learning is self-directed is also debatable [3, 6]. Self-direction is a quality of a mature learner. A young learner may possess this quality, while a chronologically older student may not. In addition, before delving into any self-directed learning, students must do self-assessments to identify their weaknesses. Young students often perform inadequate self-assessments. The drive to learn is fed partly by success. Consequently, students are more likely to study topics with which they are familiar, feeding the hunger for success rather than focusing on weak areas. Adult learners facing new subjects may need a little “pedagogical guidance” from instructors.

Another criticism of Knowles' work is that he did not comment on the use of reflection in learning [6]. In reflection, the learner considers the new material, integrating it with preexisting knowledge and resolving conflicts between new and old information. The learner can consider how to approach a task the next time, based on successes and mistakes from the first experience. Taking time to reflect on a newly learned topic ingrains the material into one's mind.

Educating adults

Adults are experienced learners who derive part of their identity from life experiences. Adult learning is enhanced when educators demonstrate *respect* for adults and their experiences. Any dismissal of the learner's experience is perceived as a rejection of himself or herself [7]. With the learners' cadre of life experiences come habits that are well established and difficult to break [7]. Despite their

motivation to learn, adults are generally resistant to changing their habits. Educators must balance respect for the learners' experiences with needed modifications of problem habits. A poor balance risks alienating the learners.

Dependence on the teacher within a pedagogical structure is counterintuitive to adult learners. Adult learners seek to solve problems on their own using their previous experience. Instructors of adult students are seen as facilitators, not teachers. Facilitators are guides who do not merely hand out information but who help students to develop their own questions and to find their own answers. This develops student self-reliance and skills that will be useful in solving future problems. Knowles and others developed recommendations for these facilitators of adult students [2, 8], detailed with examples in the following section.

Adult learning in the emergency department

The ED is a rich, problem-based, learning environment. Most emergency medicine (EM) physicians are "action-oriented" people who say, "I learn best by doing" or "I learn on my feet." The ED provides the ideal setting for such learning. The educational moments are "live"; they are "now." Skilled educators exploit these attributes of the ED, incorporating principles of adult education to create rich learning experiences for young clinicians.

However, the ED is not a comfortable learning environment. Constant distractions are normal. Time is limited and precious, creating a significant barrier to education in the ED. Faculty members are under increasing pressure to see more patients and improve documentation, limiting the time available for teaching. The balancing of time between patient care and teaching is simply another form of ED triage. Not all cases need to include an educational moment, nor must every aspect of each case be dissected to provide thorough teaching. Educators must choose their moments, as exemplified in the following sections.

Set the environment

Two environments can be optimized for learning: the physical and the interpersonal. The physical environment of the ED is a constant assault on all the senses, resulting in an array of distractions that is unparalleled in the world of education. Patients and providers are constantly on the move. Noise emanates from all directions. The lighting is harsh. The department is never big enough—patients overflow from rooms into hallway beds or large rooms with chairs and staff members compete for computer and counter space. Supplies run short, textbooks are old, and interruptions are frequent. New learners

in the ED also face sheer intimidation. Despite these inordinate challenges, learners must focus on quality, one-at-a-time patient care. It would seem impossible to make the learner to also focus on educational moments, one at a time. Teachers in the ED must choose their moments among the distractions. To the extent possible, distractions should be minimized: spaces away from the main center of the department can be used and nurses should be notified that interruptions should be minimized unless they are truly emergent. It is important to “read” your learner to see if he or she is ready for such a moment. If a student is too distracted with a current situation, you cannot effectively teach. Save the pearl for later.

Interpersonal or relationship setting is the most important piece in the entire educational endeavor. As noted earlier, adults have years of experience for which they expect, and deserve, respect. Establishing an open and respectful relationship with the adult learner is the most important first step in providing adult education. It is this relationship that encourages learners to come to their teachers; it makes the teachers approachable. Learning will not occur if the students do not want to approach or hear from the teacher. In the teaching ED, physicians-in-training must discuss their cases with a supervising physician; thus, it seems that the learners have no choice but to come to the teachers. However, if the learners do not have a good relationship with the teacher, they will modify their presentations in ways to minimize exposure to the instructors. When faculty members try to teach in the setting of poor relationships, learners will be minimally receptive. Tension can worsen with each encounter. Various reviews have described the characteristics of good teaching faculty (Table 1.2). It should be noted that they are all based on the establishment of an open and respectful relationship with the learners.

Set goals

Goals are the centerpiece of education. To the extent possible, adult learners should assist in determining their learning goals. Learners can reflect on their existing knowledge and identify gaps that must be filled. This strengthens their internal motivation and develops a sense of responsibility for their education. In an ED, goals can be established any time, including during orientation, at the beginning of a shift, or on the fly as a resuscitation is about to begin. However, learners cannot set these goals alone. Goals may emerge after negotiation between the student and teacher. Educator input is also valuable in ensuring that learners have set specific, achievable, measurable goals.

During orientation, off-service rotators and medical students should be asked to consider what they hope to achieve during their time in

Table 1.2 Characteristics of effective teachers. [9–14].

Enthusiasm
Psychosocial focus
<ul style="list-style-type: none"> ● stresses relationships with patients and staff ● is patient centered ● understands personal perspectives and social values ● is humanitarian
Identifies self as a teacher
Communication skills
<ul style="list-style-type: none"> ● listens to students ● has rapport with students ● is nonthreatening (approachable) ● asks questions carefully ● is clear and lucid ● is organized
Role model actions
<ul style="list-style-type: none"> ● is positive ● responds to teaching needs ● listens to patients ● has rapport with patients ● emphasizes relationships ● emphasizes psychosocial aspects of cases ● is knowledgeable ● is clinically competent
Encourages education and independence
<ul style="list-style-type: none"> ● actively involves students ● provides direction and feedback ● stimulates intellectual curiosity ● promotes self-direction

the ED. Many will have very limited goals. They should be challenged to expand their thinking. The ED is a place for non-EM physicians to face problems outside their chosen practice. Consider having the physicians-in-training establish a goal for the day at the beginning of a shift. It might focus on a portion of the history-taking process, such as asking each patient the nature of his or her employment. Alternatively, the learner can enhance physical examination skills, such as listening for a cardiac murmur in each patient. Educators can help the learners recognize unrealistic goals, such as improving their technique for chest tube placement.

Some non-EM rotators may want to learn all about EM while in the ED. Non-EM physicians-in-training often present unique challenges because they might have goals for the rotation that are different from their teachers' plans to teach them "emergency medicine."

An orthopedics intern might seek musculoskeletal injuries, while an internal medicine physician-in-training might conduct lengthy, inpatient workups on ED patients. It may be impossible to force these physicians-in-training to meet the instructors' desired goals. Negotiation becomes an important part of the process. Attempts to force certain goals on some learners will result in frustration for all. Admittedly, not all readers will agree with this opinion; some clinician educators believe that all rotators should be taught everything about EM.

Learners may struggle to choose goals. Instructors can assist by asking questions to identify areas of weakness. For example, a physician-in-training may say, "I hate eye complaints." Questioning reveals that this aversion is related to a lack of comfort with performing a complete eye examination. If the physician-in-training is an EM physician, the instructor can ensure the examination is taught during the shift. If the learner is not an EM physician and has no interest in learning the details of the eye exam, then time might be wasted in trying to do so. It might be time to probe again and find a weakness that is of interest.

Plan and implement new material

Involving learners in planning educational activities has many benefits, including helping the facilitators identify possible problems before they become definite issues. Facilitators can redirect learners when they are offtrack and provide recommendations for problem-solving resources.

This technique applies easily to procedures. All care providers have preferred approaches for different procedures. Physicians-in-training may not have a broad-enough exposure to different techniques. Asking one to try a different technique or approach may result in some resistance. Asking "Why do you think it may be valuable to know how to place internal jugular central lines rather than just femoral lines?" may help the learner realize that not all approaches are available in all patients. Consequently, the physician-in-training gains motivation for learning a new approach. Having learners discuss procedures before they are done reinforces the appropriate steps and identifies knowledge gaps before undertaking the tasks. Being present during the procedure is ideal, although often impractical. It is reasonable to consider that different procedures have different levels of risks and thus different levels of need for the teacher's physical presence.

Educating during a procedure or resuscitation is difficult, but these complex scenarios offer new material that can be taught immediately. Educators naturally want to intervene and/or make comments, but doing so may be at the expense of the physician-in-training. These moments require the difficult balance of patient care with education.

Intervention by the teacher can embarrass the learner, potentially harming the student–teacher relationship. However, patient care is the most important consideration. There is no easy answer for these potentially conflicting interests; there are no absolutes. Minor mistakes by a physician-in-training can be just as acceptable as the teacher stepping in at a truly life-threatening moment. Those of us who practice EM know that the truly life-threatening moments, where key decisions in a matter of very few minutes will affect life, are few. Usually, there is time for the teacher to discuss the situation with the learner, facilitating and guiding. An excellent location for the teacher is right behind the learner. From this position, the teacher can quietly make comments to the learner, enabling the learner to remain “in charge” by being the one who speaks to the resuscitation personnel. Once the life-threatening moment has passed, mistakes can be addressed during the postresuscitation review. A debriefing after such encounters is imperative. This can be used to address areas of deficiency and needs for improvement and to complement the learner on decisions or actions that were correct.

Many teachers can draw on “canned” brief presentations, such as the causes and evaluation of syncope, the management of asthma when standard medications fail, the emergency causes of chest pain, or how to interpret a chest film. Educators keep these discussions fine-tuned and ready for use when the appropriate moment presents itself. These lectures are brief, usually no longer than 3 min; this helps the learner retain the information (by avoiding information overload) and does not significantly delay patient care.

Evaluate

By evaluating their learning experiences, adult learners identify ongoing knowledge gaps and recognize whether goals were met. These evaluations do not use formalized exams; they may be done with a brief discussion between the learner and the teacher. Reviewing key aspects of patient encounters can be very helpful, especially if it includes comments on previously established goals.

A verbal discussion (or evaluation) is routine during standard patient presentations by physicians-in-training. After the presentation of history and physical examination, a physician-in-training can be asked to formulate a differential diagnosis, can be asked what he or she wants to do from this point, and can be inquired about the thought processes behind both. This gives the educator an insight into the learner’s understanding of the patient’s illness as well as whether the learner has an appropriate diagnostic approach. This also is a chance for the educator to guide the learner back on track if the plan does not seem appropriate based on the presentation.

A similar recap should take place after the physician-in-training has undertaken a specific challenge, such as a new approach in a procedure. A similar line of query such as “How did you think this went? What did you learn? What would you have done differently?” gives the learner a moment to evaluate his or her own performance, again reinforcing the new material.

Role model

Role modeling is very important to education in the ED. In some ways, this is the easiest education that teachers deliver. It requires little thought or planning—it simply involves teachers being themselves. Amazingly, EM teachers may be unaware that they are role modeling. Physicians in any senior position should be aware that their behavior can be emulated at any time [15]. This can be the most difficult part of being a teacher, as you are “on stage” all the time. An EM teacher’s every action or word is interpreted, and the interpretation may be very different from what was intended. Every verbal interaction is seen by at least one person, and the patterns soon become clear. For example, a disgusted look given to the technician for delivering another new patient’s electrocardiogram is usually witnessed by many people. The challenge is to be the best human we can be as much of the time as possible. It is no surprise that most positive human attributes parallel the characteristics of an effective teacher (Table 1.2).

Observation of the history taking and physical examination of a patient by a teacher can be illuminating to learners. The clinician’s techniques can be incorporated into their own routines: subtle uses of humor, good eye contact, and contact through a handshake. Educators can point out findings to the learners and explain why certain questions were used. Many medical educators stress the importance of bedside teaching, and certainly, demonstrating the skills of history taking and physical examination can only be done in this manner.

One of the most important items that can be role modeled is how the teacher thinks. For example, after having heard the differential diagnosis and plan from the physician-in-training, the teacher verbally explains his or her version of the same. This is more than just stating a differential diagnosis and plan. It is very powerful for the learner to hear the educator demonstrate his or her thought processes by “thinking out loud.”

An instructor can model an experience that is difficult to teach, such as informing a family of the death of a loved one. The educator can identify specific techniques ahead of time, such as bringing a chaplain or nurse as an escort and clearly stating that the loved one died.

This serves as cues for which the learner should be watching as the role model proceeds in his or her task. Afterward, the instructor can ask the learner for his or her thoughts on the experience. This serves as feedback for the instructor and embeds the experience in the learner's mind.

Conclusion

Adult learners are self-directed and goal oriented, seeking information that they can readily apply. The ED provides many appropriate educational moments for adult learners. Educators can seize these moments by helping the learner set goals, serve as a guide on the learner's path to learning but not spoon-feed answers, and help the learner evaluate his or her performance to solidify the new information.

Summary points

- 1 Adult learners have internal motivation, frequently combined with external motivation, to actively seek new information, reconcile new information with existing knowledge, and plan to rapidly apply information to a problem.
- 2 Reflection on newly learned material or tasks serves to integrate the new material into a learner's brain, making it more readily retrievable in future experiences.
- 3 Adult learners need respect for their existing knowledge base from their educators.
- 4 Setting a positive interpersonal environment will help overcome the ED's physical impediments to learning.
- 5 Physicians-in-training must develop learning goals; learners must evaluate both independently and with their educator how those goals have been met.
- 6 Educators must be open to identify opportunities for learning in the ED, such as patient presentations by physicians-in-training, procedures, and resuscitations.
- 7 Educators should realize that they are always role models; their behavior, both positive and negative, is always on display for absorption by learners.

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CHAPTER 2

Obstacles to teaching in the emergency department

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The emergency department (ED) offers what may be the greatest educational opportunity in medicine. Patients present with undifferentiated conditions from every field of medicine, requiring sophistication in history taking and physical examination, laboratory and radiologic testing, prioritization and task switching, and interpersonal interactions. However, the ED also presents significant obstacles to instructors eager to take advantage of this educational treasure trove. Many of these obstacles are inherent in the ED, such as perpetual time limitations, frequent interruptions, and lack of physical space for teaching, while others are common to instructors across medical specialties and exacerbated by the ED environment.

Obstacles inherent in the emergency department

Educators in the ED often cite lack of time as the major obstacle to teaching during a shift. While balancing patient care and teaching is always a challenge, nowhere is this truer than in the ED, with its large volume of patients and high workload. Physicians are under constant pressure to see patients rapidly, manage them efficiently, and maintain a high level of vigilance to identify the few who have truly emergent needs. The acuity of patients is a major factor in time

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limitation; just a few critically ill patients may absorb the instructor's full attention, often for long stretches of time [1].

At the same time, EDs are being held to more stringent standards of patient satisfaction, meaning that facilitating patient flow and communicating with patients and their families also remain high priorities during a shift. Additional tasks such as overseeing flow of the entire department, directing online medical control, receiving calls from primary care physicians and consultants, and arranging interhospital transfers may contribute to the workload. Emphasis on quality of documentation, out of concern for both billing and litigation, shunts the remaining time and energy toward careful charting.

Overall, the demands of patient care leave little time for teaching activities and feedback [2]. Unlike other departments in the hospital, the ED cannot set aside a structured teaching time as a routine part of the workday in the form of morning report, lunchtime conferences, or extended rounds. Teaching must occur spontaneously and is always subject to interruptions by phone calls, incoming trauma patients, or questions from nurses and other staff members [3]. Students and trainees are frequently interrupted during their presentations [4]. Even without direct interruptions, distraction comes in the form of the ever-present background noise of phones, overhead pages, and the voices of staff, patients, and their families. Contributing to the challenges of the teaching environment is the limited physical space. Depending on the layout of the department, simply finding an open area to gather for teaching can be difficult in a crowded ED in which hallways are lined with occupied patient gurneys and back-and-forth pedestrian traffic. Discussion about individual cases can be limited further by the lack of privacy.

The makeup of the learner population creates one of the most challenging aspects of teaching in the ED. Learners range from third-year medical students to senior ED residents to rotators from across medical and surgical disciplines, all with widely divergent skill sets and learning needs [5]. Knowing how to make teaching appropriate for students being exposed to the ED for the first time, for ED residents trying to hone advanced management skills, and for off-service rotators seeing cases out of their comfort zone requires a sensitivity and subtlety that may seem impossible to achieve within the confines of an 8- or 10-h shift. Exacerbating this problem is the limited face-to-face time between individual instructors and learners in the ED. In addition, unlike many services in which a learner is paired with a single instructor for an extended period, instructors and learners in the ED may have little consistent or longitudinal contact.

Instructor-based obstacles

The barriers to teaching inherent in the ED may exacerbate the personal challenges faced by any medical educator who aims to teach on a daily basis. The ED environment requires a spontaneous and flexible style of teaching that does not come naturally to many people. Training programs do not commonly provide formal education on effective teaching strategies, and young graduates who have recently become faculty may find balancing patient care with the desire to teach extremely challenging. They also find balancing learner autonomy and supervision challenging and fraught with medicolegal risk, particularly if they have not received explicit guidance or training in this skill. Even experienced physicians may feel uncertain about how best to relate important clinical points, provide constructive feedback, and determine goals for trainees [6]. Instructors may interpret the weariness of tired trainees as a lack of interest in learning, or they may feel intimidated by the niche areas of knowledge owned by off-service rotators. Because teaching is rarely rewarded in concrete ways, instructors may succumb to more explicit pressures to excel in documentation, ED flow, or patient satisfaction, setting aside teaching as a “last priority” that rarely gets attention.

Learner-based obstacles

Teachers may have trouble “getting through” to their learners, not because the teachers are ineffective, but because the learners themselves encounter obstacles in taking advantage of the educational opportunities of the ED. There are many reasons for resistance to learning. Fatigue may be a factor, especially in non-ED rotators who do not anticipate how demanding an ED schedule can be. Learners may feel, justifiably or not, that some patients are reluctant to be cared for by anyone other than a fully trained physician. In addition, students and trainees may feel overwhelmed by the wide range of clinical entities presenting to the ED and the breadth of clinical tasks they are expected to perform. Some trainees may work in specialty clinic or ambulatory care settings where patients present with a much narrower range of diseases, are generally stable, and are seen and worked up one or two at a time serially. Others may believe that their most important duty is to complete the workup of every patient they admit, in order to assist their colleagues on the inpatient wards. The variation in clinical practice styles and expectations from physicians may be confusing to learners. The learner may also be facing challenges in his or her personal life that affect performance and receptiveness. Furthermore, generational influences might affect

the educational interaction between instructors and trainees [7]. All these factors may result in learners resisting change and missing out on the main educational purpose of the ED rotation by seeking to recreate their comfort zone, selecting patients with disease entities that are familiar, delaying picking up new patients, or being dismissive of information they perceive as irrelevant to their ultimate career. Even students and trainees who are particularly motivated do not always know how or when to solicit feedback about their performance [8].

A particular type of learner-based challenge is encountered with the international emergency medicine (EM) student or trainee, who, although being highly motivated, experiences difficulty learning in the ED. Difficulty can arise from cultural differences, lack of familiarity with EM as a specialty, or very different expectations for the format and environment in which teaching should occur. Challenges specific to interactions between educators and learners from different countries are summarized in Table 2.1. These students may require additional orientation and explicit instruction on the roles and expectations in the ED. Awareness of and sensitivity to differences in international EM are fundamental to a successful experience. The program director of an international teaching experience should serve as a resource for insights into cultural expectations.

Solutions

For the aspiring educator, the obstacles discussed thus far may seem overwhelming, particularly because many of them, such as

Table 2.1 Challenges to the bedside teaching of international EM students.

In some countries outside USA, the culture of medical practice is more hierachal and less interdisciplinary, such that trainees and nurses will not be responsible for teaching.
Teaching may be based on more formal modalities, such as classrooms and lectures; therefore, informal and spontaneous teaching may make trainees feel uncomfortable.
Emergency medicine is not recognized as a specialty in other countries.
Differences in attitudes toward resource utilization create barriers to clinical teaching.
The instructor might not be familiar with the clinical guidelines and standards of care that are practiced and taught in the learner's home institution.
The educator might not appreciate the impact of political instability or conflict or cultural influences on clinical practice in the trainee's home country.
Instructors might not have easy access to resources that allow them to incorporate cultural competency in their teaching methods.

Table 2.2 Strategies for overcoming teaching obstacles in the ED.

Use a wide variety of teaching techniques
Remember that teaching is a shared responsibility among all members of the clinical staff
Be prepared for any teaching opportunities that may arise during a shift
Recognize the importance of <i>inspiration</i> as well as <i>information</i>
Spend time outside clinical shifts, acquiring teaching skills

the volume of patients and the number of responsibilities of the teaching physician, are likely to amplify over time. On the bright side, the ED offers many unique opportunities for teaching, including a wide variety of clinical entities, the breadth and depth of clinical skills that can be practiced, and the constant close contact between instructors and learners. To take advantage of these strengths, the successful teaching physician can employ the teaching strategies listed in Table 2.2, each of which is discussed in detail below.

Use a wide variety of teaching techniques

The most realistic approach to teaching in the ED is integrating it with preexisting patient care activities. This requires instructors to be flexible in using a variety of teaching techniques [1, 9, 10]. Preparation and delivery of brief (1- or 2-min) lecture points can be integrated into any of the dozens of clinical actions performed routinely in the ED (e.g., sign-out rounds, patient presentations, interpretation of radiographs or laboratory results, or procedures), ensuring that some level of teaching occurs continuously throughout the shift. Teaching involves the transfer of knowledge and can also occur in the form of feedback. By observing a student or trainee in action, instructors can offer powerful reinforcements of things done well and constructive comments on areas needing improvement [11]. This feedback does not need to come at the end of a shift, when sign-out rounds may be busy. Feedback to trainees can come right after a presentation, a particular case, or a procedure (for an expanded discussion refer to Chapter 7).

Interactive discussion is a simple, effective, and often overlooked teaching technique that can be used to encourage learners to express what they think and why, to consider alternate possibilities, and to bring up their own areas of uncertainty. Questions such as “Why do you think that?” “What else could be going on with this patient?” or “What questions do you have?” prompt learners to work through the problem and come up with their own solutions. This discussion requires the instructor to pause and refrain from interrupting for as

little as a few seconds. Furthermore, it can help instructors get to know individual learners and identify their specific educational goals.

A picture can be worth a thousand words. Whether from a book or viewed on the Internet, pictures can enhance teaching points and maximize the time for teaching. Videos of procedures and clinical conditions can be used to illustrate teaching points or offered to trainees to view independently before reconvening with the teaching clinician. Many Web-based resources are available publicly and through affiliated teaching institutions.

Remember that teaching is a shared responsibility among all members of the clinical staff

All members of the clinical team should be active partners in the teaching process, including the learner. Particularly, during a busy shift, instructors can acknowledge their own limitations and ask learners to take a greater role in the educational process. Peer teaching can be a powerful learning experience and is one that is particularly valued by millennials (Generation Y) [7]. Senior trainees can assume responsibility for teaching interns and medical students; trainees at any level can point out interesting cases to others or find articles and other resources to share with their colleagues. Rotators are a potentially rich resource and should be encouraged to share knowledge from the perspective of their specialty training. Nurses can be engaged by inviting them to participate in discussions after trauma or medical resuscitations, asking them to teach skills such as intravenous line placement and urinary bladder catheterization, and offering to include them in teaching discussions. Finally, the learner should be expected to take an active role in the educational experience by creating their own goals, soliciting feedback, and using printed and Web-based resources to learn more about new topics. While it is important to determine individual learning goals, it is likewise important for the educator to explicitly set educational and professional expectations. Learners should be told what is expected in terms of their role in patient care and learning outside the clinical setting, such as reading on their own to answer clinical questions.

Be well prepared for any teaching opportunities that arise during a shift

Particularly if there is no structured time during a shift to teach, instructors in the ED should be prepared to take advantage of all available opportunities to teach. Despite the “never-know-what-is-coming-next” quality of the ED, certain situations occur reliably and lend themselves well to teaching. Sign-out rounds, when all staff members are gathered in one place, allow brief discussion of common clinical entities presenting to the ED and are a good opportunity

for focused teaching points. High-profile cases such as trauma or resuscitations, which tend to naturally pique the interest of students and trainees, may be followed by a “debriefing” to review core management issues. An unusual presentation or physical finding may be relayed to all learners, even those not directly involved with that patient’s care.

Downtime is rare in the ED, but it occasionally occurs when the department is well staffed or patient volume is low. Having a stock activity for unexpected free time will avoid having to teach extemporaneously; a mock code, a short lecture, or an easily accessible file of electrocardiograms or radiographs can make even 5 or 10 min a high-yield experience. It is also helpful to have a plan for independent learning in case individual learners have time between patients or while awaiting test results; they can be directed to access a teaching file or find their own resources to review a topic and share it with others by the end of the shift [10, 12]. The use of educational prescription cards (Figure 2.1) can remind students and instructors about clinical questions that arise and make sure they are addressed in a timely manner [13].

 Educational Prescription For: _____ (Resident name) _____
Patient or Condition:
Clinical Question:
Date and Place to Present Findings:
Presentations will cover the following: <ol style="list-style-type: none">1. Search strategy2. Search results3. Validity of the evidence4. Importance of the evidence5. Applicability of the evidence to your patient

Figure 2.1 Sample educational prescription. Adapted with permission from Education Prescription. Centre for Evidence-Based Medicine, Toronto. Available at www.cebm.utoronto.ca/doc/edupres.doc. Accessed on March 17, 2012.

Recognize the importance of inspiration as well as information

Occasionally, the actual deficiency faced by the learner will be difficult to identify. If an intubation has failed because positioning was wrong, then instruction on adjusting the position can be useful. For the learner who provides an ineffective oral presentation or seems to miss the essential clinical observation, the role of the educator may be more inspirational than educational. A supportive word to a struggling learner, emphasizing the learner's abilities and pointing out similar challenges the educator has encountered in the past, may have a far greater impact on instilling confidence and improving performance than providing a solitary piece of information or trying to figure out how to fix an ill-defined weakness.

Spend time outside clinical shifts acquiring teaching skills

Teaching, like any other skill, requires training and practice. Outside the clinical shift, instructors can pursue opportunities to develop their teaching abilities through faculty development seminars and training programs [14–16]. These sessions may be targeted and as brief as an hour, entail a broader curriculum over days, or take the form of a workshop at a professional conference. In recent years, the body of literature about effective teaching in the clinical setting [9, 17, 18], and even specifically in the ED [1, 19–21], has grown tremendously. Compiling and disseminating a faculty curriculum, sharing and reviewing articles in a faculty meeting, or devoting conference time to the discussion of articles can raise awareness of teaching techniques, establish teaching as a high priority in the department, and bypass the relatively costly alternative of formal faculty development courses. Some institutions sponsor workshops presented by professional development offices. Colleagues can be invaluable resources as well, particularly those recognized as effective educators; even informal discussions with them may give valuable insight into their teaching techniques. Finally, understanding the core competencies of the Accreditation Council for Graduate Medical Education (ACGME) will be very helpful in directing teaching [22]. These core competencies constitute domains of clinical skills in which proficiency is required before US medical graduates are certified to practice independently; therefore, referring regularly to these standards may help guide the content of the specific feedback given to trainees.

Conclusion

With all of the fixed responsibilities of an ED physician, the reminder to add teaching time may feel like the proverbial last straw, particularly

in a challenging practice environment that presents so many unavoidable obstacles to teaching. However, rich learning potential is also an inherent quality of the ED, and instructors can adopt teaching strategies that will realize this potential, making every shift both educational and inspirational.

Summary points

- 1 Challenges to teaching arise not only from the busy ED setting itself but also from instructor- and learner-based factors.
- 2 Instructors can overcome obstacles to teaching in the ED by using a strategy that incorporates varied teaching techniques, shared teaching responsibility, preparation for spontaneous teaching activities, encouragement of learners, and investment in faculty development programs.
- 3 Despite many obstacles to teaching, the ED has the potential to be one of the most productive learning environments in the hospital.

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CHAPTER 3

Teaching and patient care in emergency medicine

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Introduction

Why do we choose to teach emergency medicine (EM)? This is a question frequently asked of EM faculty. There are a variety of reasons—some obvious and some subtle. Every emergency physician has benefited from the skills of talented educators, role models, and mentors during his or her career. For some, the chance to give back to future generations is enough motivation. Others cite external motivators such as teaching awards and potential for academic promotion. Everyone experiences these motivators to differing degrees, and nearly everyone needs some motivation to make it through challenging times. In this chapter, we explore some of the reasons emergency physicians teach and some of the factors that tie EM teaching to excellence in patient care.

Motivation for teaching emergency medicine

Faculty members in EM choose this profession, and their career roles, for a variety of reasons. For some, it is the simple desire to educate and train future physicians. For others, the personal and career opportunities offered by a career in education make this an attractive option. In some specialties, a variety of rewards have been used to stimulate faculty teaching. These include financial incentives, educational opportunities, gifts, teaching awards, special recognition events, and appreciation letters [1, 2]. The chance to gain and develop

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other professional and leadership skills, such as presentation skills, conflict resolution techniques, business communication skills, and project management tools, provides a career balance that helps to maintain motivation and job satisfaction for many educators. Also, the opportunity to complement an active role in clinical care and teaching with official, educational, and research activities can be a strong motivator.

Many medical schools and institutions award tangible motivation in the form of wall plaques and teaching opportunities, but internal motivation seems to be a stronger force in the decision to teach [2–4]. Similarly, financial incentives for teaching positions usually are not as great as those in private practice [5, 6]. Finally, the opportunity to be a part of, and to interact with, a dynamic teaching faculty within a program, department/division, or institution can be a strong motivator. Associating with colleagues sharing similar beliefs, goals, and attitudes toward teaching and mentoring residents and students are key components of the academic environment.

The beginning educator

Early in an academic career, a medical educator typically focuses on activities related to core medical knowledge. In many instances, this physician either is preparing for or has recently completed the board certification examination in EM. This provides fertile ground for teaching activities focusing on core knowledge and skills. Teaching activities early in one's career encourage the development of a variety of administrative skills, including education and curriculum planning, negotiation and communication skills, learning to function amid organization politics, and time management and personal development goals. Success in early career activities can set the stage for future leadership positions such as medical student rotation directors, residency/specialty training program directors, departmental chairs, institutional/medical school leadership (e.g., dean's office) positions, and leadership roles in local, regional, national, and international organizations. Creating and running a successful educational session, class, or program is a fundamental step in faculty development. The transition to subsequent stages of a medical education career requires different goals, activities, and skills.

The seasoned veteran

In mid-career, an individual's goals usually change, which is reflected in educational and teaching activities. By this point, individual

skills, including teaching in one-on-one situations, small groups, and large-group sessions, have generally developed to a level of proficiency, and the focus often shifts to coordinating group educational activities, taking leadership roles for expanding and improving other faculty members' teaching skills, and developing educational curricula and programs. Individual teaching and skills continue to be a focus, but these physicians find themselves to be subject-matter experts with regard to medical education and teaching and often seek academic activities that highlight their unique skills and experiences.

Course directorships and other leadership roles are part of the natural evolution of the medical educator's career during this phase. These physicians have been involved in education long enough to know the basics and understand the common pitfalls to avoid to ensure success. They become excellent resources for junior faculty members and can serve as mentors, collaborators, and role models. Competing administrative, clinical, research, and other interests can change individual career goals, but those interested in continuing a career focused on medical education develop opportunities to hone specific skills and might advance toward national and even international prominence.

The master educator

The next stage of the medical education career usually involves publications, speaking engagements, and other high-profile activities. Physicians in this group are truly the cream of the crop and have the requisite skills and knowledge to be effective individual educators; they also have gathered the necessary influence and experience to become the true drivers of large-scale medical education activities and curricula. These master educators have time to develop individual educational philosophies and now have the sphere of influence needed to implement and disseminate their ideas.

The benefits of teaching in emergency medicine

Training the doctors of tomorrow

Considered the primary goal of academic faculty members, clinical and didactic teaching remains a primary purpose for the EM faculty. A major component of the traditional academic "triple threat" of patient care, education, and research, the training of tomorrow's physicians is as important now as it has ever been. With rapid advances in medical technology and informatics, teaching in EM is, in some ways, more challenging as well. Walking the fine line between embracing the technologies of the future while maintaining a bastion of the

clinical skills of the past, EM educators are able to provide medical students and physicians-in-training the best of both worlds. In many specialties, physicians proceed directly to testing for a multitude of patient presentations. In the emergency department (ED), the initial evaluation of a critically ill or injured patient still boils down to basic clinical skills. In many ways, emergency physicians and educators possess the broadest skill set for the evaluation of acutely ill patients. All of this benefits medical students, as the ED clerkship is often their first opportunity to evaluate undifferentiated acutely ill patients. This unique factor, in addition to the concentration and diversity of patient pathology seen in the typical teaching ED, makes a rotation or training program in EM an outstanding learning experience for physicians-in-training [7].

A natural extension of the key role of EM in medical education is the development of specific rotations. Master educators have led the transformation of these rotations into core components of the undergraduate medical education curriculum [8, 9]. Career development for educators focusing specifically on EM education of undergraduates has led to an appropriate body of knowledge and resources for continued improvements in this area [9, 10].

All of these efforts in undergraduate EM education reflect an increasing responsibility for the preparation of future generations of physicians to provide emergency care. While some physicians-in-training ultimately will choose careers in academic medicine and teaching, the majority of EM graduates proceed into careers in nonacademic hospital settings [11, 12]. Thus, the education provided by teachers in EM can influence the full spectrum of future academicians as well as community-based physicians. With this broad appeal, EM physicians are sought out to provide guidance for a wide range of future career options.

This role specifically benefits future emergency physicians via a mentoring process. Career guidance, with specific attention to the choice of rotations, schedules, postgraduate training programs, and career goals, are all part of the role of the EM educator [13, 14]. There is even a role for virtual advisors (via the Internet and email communications) through the Society for Academic Emergency Medicine, which enables faculty members to become mentors for students at institutions without EM residency programs [15].

Active mentoring occurs on all levels, and mentorship for clinician–educators in EM has been described [16]. In many parts of the world, EM is still in its infancy; therefore, critical mentorship and development will be needed for many years at all levels, from students to faculty to regional/national developers of training programs [17, 18].

Developing areas of specialty interest

The burgeoning field of EM features a wide variety of subspecialty knowledge and skills. Teaching physicians are involved in various fields, from the formally acknowledged fields of pediatric EM, toxicology, emergency medical services (EMS), and critical care, for which subspecialty fellowships have been developed, to a host of other areas. Emergency ultrasound, administration, tactical EMS, medical informatics, and international EM have evolved to include fellowship training programs and thus require faculty with specific expertise and teaching skills in these areas. Within nearly every academic practice group, specific physicians are also known as the *go-to* people for questions regarding specific areas. These physicians attain knowledge through seminars, minifellowships, individual study, and continuing medical education courses, as well as attendance and participation at regional, national, and international meetings, such as those sponsored by the American Academy of Emergency Medicine, the Society for Academic Emergency Medicine, and the American College of Emergency Physicians in USA. Other major conferences include the biannual International Conference on Emergency Medicine and symposia sponsored by the International Federation for Emergency Medicine and the Mediterranean Emergency Medicine Congress. Subject-matter experts have unique skills and knowledge in emergency imaging, domestic violence treatment and education programs, cardiovascular and neurologic emergencies, quality assurance and process improvement activities, medicolegal and risk management processes, geriatric issues, and women's health issues, among others. An area that spans multiple specialties is emerging as an area of great strength for EM educators. Medical simulation offers the challenge of integrating medical knowledge, attitudes, and skills in case scenarios, procedure-based learning activities, and role playing [19]. This area should be an important focus for EM education in the future.

With specific educators having advanced knowledge in these areas, opportunities for focused education for medical students and residents abound. One of the first steps in attaining long-term success in medical research is development of a focused knowledge base or niche expertise. This generates research questions that can ultimately lead to studies and other activities. This generation of specialty-specific research has been one of the goals of the specialty of EM since its inception [20, 21].

Forming the backbone of local, regional, national, and international organizations

EM educators are often leaders in clinical and research activities as well as within their institutions and communities. Being a part of

cutting-edge research and patient care activities uniquely positions EM educators to be leaders and participants in a variety of organizations. From an academic standpoint, EM educators interact with students, physicians-in-training, and faculty from nearly every other specialty. This familiarity aids EM educators interested in leadership positions within their departments or divisions and in advancement within the educational and administrative hierarchy of their institution and/or university. From a specialty and political standpoint, the leadership skills gained by interactions within local institutions as well as the structured nonclinical time inherent in EM training programs provide opportunities for advancement in regional and national specialty organizations, in addition to medical organizations that cross specialty lines or represent medicine as a whole. Finally, from a community standpoint, the EM educator often has valuable skills in administration, leadership, and project management. This makes them prime candidates for leadership positions within community groups.

Improving patient care and safety

Defining the standard of care

The fundamental process of teaching leads to increased critical appraisal of the medical literature and current practices and procedures. Faculty members in teaching roles help define the standard of practice in EM. A key subset of EM practice encompasses procedural skills. Teaching physicians are often innovators of new techniques, approaches, and equipment for procedures. Simulation-based medical education is an area of intense interest [19, 22, 23]. The focus on simulation-based education leads to improved patient care, while applying principles of crew resource management and analysis of medical and systems errors. Educators in EM have also been proactive in designing specific curricula for programs covering patient safety and error reduction [24].

Teaching physicians tend to be innovators in developing patient care practices, protocols, and procedures, which define the standard of care in EM. Emergency ultrasound is an example of this type of process. Innovators in EM education are helping shape the general medical school curriculum of the future through the integration of ultrasound teaching programs [25]. There is a natural association between research and continuous performance improvement because projects led by EM educators are often linked to changes in patient care. Postgraduate training programs and medical student educational experiences allow interaction between established educators

and researchers and talented new medical professionals. This allows the formation of a dynamic organization geared toward producing new knowledge and practices.

Emergency medicine education: foundations for the future

Perhaps the longest reaching effect of teaching in EM is the joy of seeing students and physicians-in-training from years past succeed and grow to become the next generation of practicing emergency physicians. The role of a teacher is not always an easy one, but the benefits are clear. Solid teaching skills and the ability to motivate and involve today's EM learners will result in a stronger, more stable specialty and positively influence learners and patients for many years. One high point of EM education lies in the creation of the curriculum guiding all educational activities. In USA, the Model of the Clinical Practice of Emergency Medicine represents the hard work of educators, researchers, and administrators from multiple EM organizations in standardizing the goals of EM education [26]. Similar documents have been developed by the Royal College of Physicians and Surgeons of Canada, the College of Emergency Medicine in UK, and the Australasian College for Emergency Medicine [27–29]. The International Federation for Emergency Medicine has also published a curriculum for medical student education in EM [30]. The groups that developed these documents include educators who have devoted their careers toward improving EM education and practice for the future [31–33].

Conclusion

There are many reasons for teaching EM. Each physician has his or her specific reasons for participating. Most physicians have several motivators. For many, the desire to be actively involved in clinical, didactic, and research training for tomorrow's emergency physicians appears to be a primary goal. Enhancing patient care and patient safety are common factors, as is the desire to guide and enhance the standards of patient care. The development of specific faculty interest areas, career and professional development, and interaction with a variety of professionals in teaching and administrative roles are significant motivators for some educators. While the specific reasons for teaching vary from person to person, the overriding goals of advancing our personal and professional lives and advancing the specialty of EM appeal to all.

Summary points

- 1 A variety of educational, business, leadership, and professional development goals shape the career paths of EM educators.
- 2 Most educators follow a typical progression en route to the role of master educator.
- 3 EM educators have unique opportunities to shape their professional world in the areas of service, leadership, research, and defining standards of care.

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CHAPTER 4

Mentoring in emergency medicine

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Mentor and mentoring defined

A mentor is someone who takes a special interest in the professional development of a less experienced colleague [1]. This individual (the mentor) provides guidance and support to another individual (the mentee), with the desired goal of improving that individual's development. Dictionary definitions of a mentor vary, but they essentially describe an experienced and trusted advisor, counselor, guide, tutor, or coach, often in an organization or institution, who trains and counsels new employees or students. Contemporary definitions include "a trusted and experienced advisor who has a direct interest in the development and education of another individual" and "an artist of enlightenment" [2].

The term *mentor* dates back to Homer's *Odyssey* from ancient Greek literature. Odysseus leaves his son Telemachus in the care of a trusted friend (Mentor) when he leaves for the Trojan War. Mentor served as Telemachus' loyal guardian and wise advisor and later helped Telemachus find his father when Odysseus did not return. Under Mentor's guidance, Telemachus matured and developed his own identity. Athena, the goddess of wisdom, intermittently took the form of Mentor, imparting advice and wisdom of a personal nature. In Greek, mentoring has become synonymous with the term *enduring*. Ancient Chinese kings used a form of mentoring called *Shan Jang* (to cede or yield) to pass the crown to a successor. The literal translation

is “the enlightened stepping aside to create room...for the next deserving person to step in and take charge.”

Despite the importance of mentoring for physicians and the medical profession, neither *mentor* nor *mentoring* appears in *Dorland’s Illustrated Medical Dictionary*, 31st edition. Mentoring is an intentional process of interaction between two individuals, which includes nurturing to promote growth and development of the mentee (or protégé). It is an insightful process in which the mentor’s wisdom is acquired by the mentee and modified as needed, as well as a process that is supportive and often protective. The successful mentor–mentee relationship therefore requires *active* participation of both parties [3, 4].

The mentoring relationship can be structured or loose. It can be a relatively short process or an ongoing (enduring) one. There are often breaks in the relationship, which can be reestablished in the future. Both individuals should be enriched by this relationship, although the gains of the mentee initially appear far greater than those of the mentor. In that sense, altruism and volunteerism toward a junior professional colleague serve as the foundation of every mentor–mentee relationship.

The surgeon Harvey Cushing had as his mentor internist Sir William Osler. Such a relationship between specialists would be uncommon today because physicians with different backgrounds collaborate infrequently. For whatever reasons, many physicians are “encouraged” to be skeptical of physicians from other disciplines. However, individuals with dissimilar backgrounds in different specialties often have tremendous insight to offer those willing to learn and unafraid to benefit from others. Research mentoring commonly involves relationships between individuals with different backgrounds and research interests yet having a shared goal of producing meaningful evidence that advances scientific knowledge. In international settings, faculty mentors who teach and practice emergency medicine (EM) are often specialists trained in other disciplines, which creates further important collaboration between specialties.

Why mentoring is important

The literature consistently reports that professionals with strong mentors are more productive and have greater career satisfaction, both in the short and long term [5–11]. Research suggests that academic physicians with mentors publish more articles in peer-reviewed journals and are more confident in their abilities than their peers without mentors [12]. Individuals describing positive mentoring relationships, as well as those with any mentoring, report greater perceived success. One study, despite its selection bias, found that professionals without

mentors reported lower salaries than their peers with mentors [13]. Furthermore, strong mentoring relationships have the most influence on a mentee's ultimate career selection [14, 15]. The advantages of mentoring hold especially true for women; unfortunately, they report that mentoring is less available to them than to their male colleagues [12]. A large proportion of students, residents, and even junior faculty never experience a true mentor relationship and identify this as one of the most important factors hindering their career progression [15, 16]. Mentors do not have to be similar in gender, age, clinical interests, or personality, yet many mentees (and mentors) believe this to be necessary. Professional societies recognize the importance of mentoring; many have established formal mentoring programs offering potential mentors and mentoring resources. Several EM organizations, including those committed to international EM, have also developed formalized mentoring programs. Faculty development workshops and committees have become increasingly common in EM and other specialties, resulting in improved mentoring relationships throughout all medical disciplines. Educational sessions related to mentoring occur with increased frequency at local, state, national, and international meetings. These venues provide excellent networking opportunities to exchange ideas during roundtable discussions, question-and-answer sessions, and small-group forums, resulting in improved mentoring at all levels.

Benefits of mentorship

Mentees clearly benefit from having mentors. Academic literature on mentoring demonstrates greater success, faster promotions, increased salaries, and improved satisfaction (Table 4.1). Although the majority

Table 4.1 Benefits to the mentee.

Confidence
Academic success (promotion, tenure, salary)
Professional and personal satisfaction
Professional safety and security
Committee involvement
Project opportunities—writing, research, administrative
Funding
Improved understanding of roles, responsibilities, and political climate
Introductions to medical staff (nurses, consultants, primary care providers, administrators)
Clinical activities and best practices
Feedback (confidential, constructive, nonthreatening)

Table 4.2 Benefits to the mentor.

Rekindled passion and excitement about (emergency) medicine
Increased professional and personal satisfaction
Participation in a colleague's development (direct and indirect, immediate and long term)
Exposure to new ideas and opportunities
Pride in the mentee's successes (includes promotion, retention, tenure)
Personal growth
Increased creativity
Opportunity to share one's values with others
Academic advancement (many academic departments recognize the mentoring process)
Lower likelihood of burnout
Increased salary
Involvement in and witnessing change (particularly in new EM systems developed internationally)

of literature focuses on benefits of mentorship to the mentee, mentors often benefit from these relationships in a number of unanticipated ways (Table 4.2). Coates writes that mentoring relationships are likely to produce similarly positive outcomes of personal satisfaction, collaboration, and academic and institutional advancement for the mentor [17]. Furthermore, mentors are less likely to “burnout” or reach a plateau compared with cohorts who are not mentors [18, 19].

The mentoring process

Mentoring is a special form of educational and professional service that is highly personal. It must be individualized to meet the needs of the mentee. The mentoring relationship is dynamic. It evolves over time, during which both parties continually define and redefine their roles [20]. Mentoring should be considered a process, not a product. This is often difficult for physicians, who naturally tend to be goal oriented. Because the results of mentoring are not always seen immediately, this activity becomes even more challenging for emergency physicians who prefer immediate results from their actions. Mentoring relationships must remain noncompetitive and confidential. Mentors may see qualities in or opportunities for their mentee that their mentee does not see. Mentors should attempt to foster successes in areas their mentee did not think possible.

Mentoring can occur in person, over the telephone, electronically (via email or video conferencing), and through general mail. These options make long-distance or even international mentoring possible. Articles or references can be exchanged, describing specific research

or research-related challenges, topics discussed during previous interactions, information that might benefit the mentee, areas of specific interest (even if these are not mutual), information published by key individuals in a certain area, and subjects of general interest. Appointments to meet can be scheduled at international, national, state, regional, or local meetings. Although it is much less likely for international mentors and mentees to meet, it does occur. With more US medical schools and EM training programs becoming involved in EM education and systems development at the international level, opportunities for international mentorship will increase. If a meeting is planned, a preestablished agenda maximizes the value of this interaction and may help the mentor meet his or her mentee's needs. Both parties will be better prepared for a meeting if an agenda is set in advance. This agenda should have a time limit established to make sure there is time to cover what the mentee needs during the meeting and to prevent the mentor from being overwhelmed. Unquestionably, time efficiency and sensitivity are critical to the mentor and the mentee; availability is rarely a perfect match between these two parties.

The hierarchical nature of the mentor–mentee relationship may complicate this experience. Because of their advanced knowledge and seniority, mentors are typically more powerful than their mentees. Mentors must use caution if they suggest shortcuts or behaviors privileged by experience, such as those related to direct patient care, research, authorship, committee work, or interpersonal interactions. They must be careful not to exert undue pressure on their mentee's decisions with respect to patient care, scheduling, project selection, committee participation, or career direction. Most mentees will have more than one mentor, which should not be interpreted as a mentor's failure. The nonexclusive nature of the mentoring relationship is healthy and appropriate. Having more than one mentor offers mentees the opportunity to gain knowledge from more than one authority (and more than one perspective).

Individuals desiring mentorship should be encouraged to seek mentors from faculty committed to their personal and professional growth and to their success within EM, the hospital environment, and the academic milieu. In general, a successful mentor should be dedicated to their mentee's well-being. Despite this, mentors should allow mentees to make their own decisions, even if they disagree or know these decisions might not result in favorable outcomes. Mentees must be allowed to make mistakes and learn from them. A fine line exists between being appropriately attentive (sharing observations), overprotective (not allowing missteps, which can provide tremendous learning), and smothering (dominance or control). Mentors should

remain toward the left of this “scale.” It is appropriate for mentors to be protective of their mentees, but it is necessary that this be done in a skillful manner that allows mentees to identify for themselves the need to redirect or reframe whatever challenge(s) they face.

Selecting a faculty mentor, especially the “best” or “right” one, is difficult on many levels. First, there is unlikely one best or right mentor for each mentee. Second, relationships are challenging—personalities and ideas of even the most successful “partners” often clash. Exposure to a broad selection of EM faculty may be limited early in a mentee’s career. Faculty biographies of those interested in mentoring, including professional and personal interests, research activities, and previous mentoring experiences, should be made available on websites, on faculty home pages, or through the division or department, the graduate medical education office, or the dean’s office in the medical school. Verbal recommendations (from administrators, faculty at any level, residents, or other students) and EM interest groups are also good places to meet possible mentors and learn about their interests [21, 22]. Mentees must be made comfortable with the knowledge that they can change mentors, for any reason, without concern of retribution to themselves or their mentor. Changing mentors is common throughout one’s career, particularly at the beginning of the mentoring process, when this relationship is especially dynamic and often includes intense personal interactions.

Experienced individuals with stellar reputations for honesty, integrity, and insight generally make ideal mentors. Good listening skills are important for this relationship to work. Administrators (including departmental chairs, chiefs, assistant chiefs, medical directors, hospital executives, managers, senior researchers, and experienced clinicians) who have an interest in actively participating in mentoring may also provide invaluable mentoring to interested parties [23]. Faculty members closer in age and experience to mentees should be encouraged to participate in this noble responsibility, despite not having long histories of mentoring, advanced positions, or tenure. Often, these individuals serve as the most dedicated mentors, given that they are not too far removed from their mentee’s current position and may have greater availability. “Face time” with prospective mentors (staff meetings, lectures, shadowing, medical school courses, interest groups, disaster exercises, emergency medical services [EMS] activities, or formal mentoring programs) offers opportunities for mentees to connect with mentors. This may also occur during meals, sporting events, social activities, and required hospital gatherings. Mentors who make themselves available provide exposure that helps establish relationships with prospective mentees around common interests. Sometimes, presence and enthusiasm are enough to initiate

a mentoring relationship, during which both parties can meet, learn from each other, and benefit. Mentors were not born mentors; there is a learning curve and skill development necessary to this process. Hosting or attending events directed at individuals interested in or beginning EM careers provides a wonderful opportunity to interact with colleagues outside the hospital or emergency department setting.

A number of important responsibilities are associated with the mentoring relationship. This relationship is critical to the development of the mentee, yet it may be abused (as can any relationship with discordant levels of power and influence). In fact, either the mentor or the mentee may abuse a mentoring relationship. A number of responsibilities exist for both parties associated with this relationship. It is not the mentor's responsibility to monitor behavior and prevent all danger from occurring to his or her mentee; if the mentee expects this and acts inappropriately, this is abusive of the relationship. Mentees must not expect his or her mentor to take on or complete work for them, such as editing or submitting manuscripts; applying for positions or grants; performing statistical analysis; writing conclusions on research projects; negotiating promotions, raises, or protected time; or managing conflict with hospital staff (including nurses). Mentors should not expect their mentee to take on scholarly activities, edit or write manuscripts, collect or analyze data, or complete research for them. Ethical behavior with integrity on the part of both mentee and mentor is crucial for success (Tables 4.3–4.5).

Successful mentors and pitfalls of mentoring

Successful mentoring involves special qualities of both parties: capable mentors and mentees who want to learn and succeed. Passion and caring are important attributes of mentors, as are listening skills and commitment to the needs and desires of the mentee. Mentoring is not parenting; parents exhibit complete authority and may need to make decisions independently for their child. Mentoring is more consistent with advising or coaching. Adult mentees must make their own decisions regarding their future based on the knowledge shared and wisdom gained from their mentors (as well as other factors). Mentoring is an active process, which includes the exchange of ideas, the development of strategies for present and future successes, learned reflection, and interaction between the mentor and the mentee on a respectful level. This active process takes time and commitment and is a tremendous responsibility. Role modeling is one of several elements of mentoring, although it is a more passive activity. Good mentors must be patient and have as their "agenda" their mentee's success, which must be determined by their mentee (Table 4.6).

Table 4.3 Mentor responsibilities.

Treat mentee with courtesy and respect
Be sensitive to cultural, gender, age, religious, and ethnic differences
Be honest
Limit the number of mentees
Determine how the mentee likes to spend time
Promote the interests of the mentee rather than own
Be sensitive to behavioral or physical changes that indicate mentee stress
Facilitate networking (introductions at meetings, conferences, social events)
Offer career advice
Offer to write letters of recommendation (for promotion, awards, positions)
Educate and instruct (clinical activities, authoring letters of recommendation for others, teaching, interpersonal interactions, conflict management, etc.)
Provide candid feedback in a constructive and caring manner
Lead by example (serve as a role model)
Maintain availability and flexibility for regular meetings (in person, electronic, telephone)
Promptly answer questions or requests from mentee
Commit time and energy on a regular and ongoing basis
Follow through
Encourage positive behaviors in and excellence from mentee
Hold mentee to high but obtainable standards
Encourage mentee to reach his or her potential, assisting whenever possible
Assist in mentee's identity development
Protect mentee from possible threats
Inform mentee about new opportunities
Suggest alternate resources for information about academic opportunities, political culture, and networking
Receive feedback from mentee without fear
Share personal knowledge (medical and nonmedical), including failures
Serve as a champion or advocate for the mentee
Be explicit about credit for work
Allow a confidential forum for mentee's concerns, difficulties, and dissatisfactions

Based on [1–4, 24].

Mentors must carefully consider their mentee's needs and balance these with their desire to help their mentee succeed. Whatever satisfaction they gain from their mentee's success must be balanced against any desire to do something for their mentee "in their best interest," especially if it is not what their mentee desires. This is one of the many pitfalls of the mentoring process (Table 4.7).

Role of mentoring in medical education

In the past decade, medical education has changed. Bedside skills and behavior modeling have assumed much greater roles for junior

Table 4.4 Research mentor responsibilities.

Provide thoughtful oversight
Impart knowledge
Direct mentee to the right people for help (statisticians, grant writing, institutional review board, etc.)
Discuss research ethics
Ensure scientific integrity (if possible)
Assist with grant applications
Direct toward research awards and conferences
Provide feedback on presentations
Offer opportunity for mentee rehearsal
Identify areas of further research
Suggest improvements and limitations

Drawn from [1].

Table 4.5 Mentee responsibilities.

Conduct oneself in a mature and ethical manner
Be mindful of mentor time constraints and limitations
Take initiative in asking questions, finding projects, and developing ideas and projects
Take responsibility for directing one's own career
Be interested in and commit time to the relationship
Apply mentor's suggestions
Appropriately acknowledge mentor when opportunities exist
Find other mentors
Remind mentor that you have other mentors
Inform (and remind) mentor of project deadlines
Notify mentor of accomplishments (awards, publications, grants, promotions)
Share personal triumphs with mentor

Table 4.6 Qualities of a good mentor.

Is committed to his or her mentee and the mentoring process
Has realistic expectations of the mentee–mentor relationship
Is available and approachable
Listens well and demonstrates patience
Maintains confidentiality
Keeps promises and follows through
Is not judgmental and accepts personal differences (including appearances)
Demonstrates sensitivity to the mentee's needs
Has mentee's best interests in mind
Enjoys watching his or her mentee's growth and development
Exhibits high professional and moral character
Treats others with respect (and is respected)

Based on [2, 4, 9].

Table 4.7 Pitfalls of mentoring.

Having inappropriate expectations (either mentee or mentor)
Accepting responsibility or credit for work that is not one's own (such as authorship, grants, ideas, or research)
Lacking availability or schedule flexibility
Engaging in inappropriate or insensitive interpersonal interactions, especially related to gender, culture, or age
Failing to recognize limitations and not providing alternative resources
Expecting exclusivity
Doing work for mentee (or mentor)
Behaving not in the mentee's best interest or according to his or her desires
Inability or unwillingness to share own failures or missteps
Breaching confidentiality
Failing to anticipate challenges or obstacles in the mentoring process or giving up on the process too soon

Based on [2, 4].

faculty, residents, and students. Simulation is one opportunity during which faculty members observe and critique interactions with “patients,” colleagues, and simulated scenarios [24–26]. Many hospitals have integrated simulation exercises to better prepare their medical staff for rare or important (or both) medical conditions. Most medical schools have modified their curricula to get students out of the classroom and into the examination room earlier. Increasing numbers of introduction to clinical medicine courses illustrate this trend, many with EM faculty as instructors. As a result, students and trainees model their professional behaviors after clinicians earlier in their careers. A positive attitude, compassion for patients, and personal integrity are qualities they respect and emulate. According to surveys of students and young physicians, enthusiasm for the specialty and the practice of medicine are critical characteristics of role models and mentors. Although role models do not play as active a role in career development as mentors, they share an equally important role. In fact, many students and residents select mentors on the basis of personal qualities rather than academic accomplishments. Many mentors began as role models for students, only to be asked to serve as mentors at a later time. Direct clinical observation of students, residents, and even junior faculty provides an excellent opportunity to offer feedback and demonstrate skilled patient care interactions. Clearly, today’s medical students and residents place tremendous emphasis on doctor–patient relationships and the psychosocial aspects of medicine. Younger health care professionals are more likely to discuss personal issues with peers and supervisors than in the past, perhaps in part due

to generational issues or parental relationships. These are all reasons why meaningful mentoring relationships should be encouraged at all levels of training.

A paucity of mentors exists for several reasons. The literature confirms that there are fewer effective mentors for women and underrepresented minorities in academic medicine [13, 27–29]. Although increasing, a smaller percentage of women have extended careers and an advanced academic rank in EM [30–34]. This is also true of minority faculty in EM and other specialties. The number of female medical students has only recently equaled the number of male medical students; therefore, it will take some time before a sufficient number of experienced female faculty become available to all of the female students who prefer a female mentor. Inherent gender differences in styles of communication, interaction, and competition have been clearly described, which may influence academic promotion [27]. Confidence, stress, and conflict resolution are perceived and handled differently by students, residents, and physicians according to gender [35–37]. It is important that our specialty's future physicians receive mentoring that accommodates differences in gender, culture, and professional satisfaction inherent in women and minority candidates. Some institutions lack minority EM faculty or have too few faculty members prepared to advise on minority issues. Several recommendations of the Underrepresented Minority Research/Mentorship Task Force of the Society for Academic Emergency Medicine (SAEM) include targeting underrepresented minority medical students through early mentorship and clinical opportunities, in addition to encouraging the involvement of EM faculty at minority organizations [38].

There is also a shortage of mentors in EM internationally. In many countries, EM education and EM systems are in the early stages of development, so experienced emergency physicians who might provide mentorship do not exist. Furthermore, international faculty dedicated to EM may not have received mentoring during their training and therefore may not possess adequate mentoring skills. Finding mentors may be challenging for individuals developing education or EM systems within their own geographic locale, especially if establishing these *de novo*. Furthermore, clinical, economic, and cultural pressures are likely to interfere with establishing and nurturing traditional mentor–mentee relationships.

Despite the positive experience that comes from having a mentor, not all individuals enter a mentoring relationship. Many students, residents, and junior faculty are not aware that a mentoring relationship assumes such importance. Potential mentees may feel they are bothering a busy faculty member, so they do not pursue these relationships.

Faculty members may feel that the commitment of time, energy, and resources to a potential mentee distracts them from more important academic and personal responsibilities [39, 40]. They may also feel unprepared or lack the skills needed for success. Nevertheless, academic faculty should be encouraged to serve as mentors for our specialty's future physicians whenever possible, especially when common interests exist inside medicine (e.g., business, risk management, health policy, research, teaching, operations, administration, clinical interests) or outside (e.g., sports, hobbies, literature, history, music, food). It is important to make time for this growth experience once it is initiated, which includes being approachable, available, and enthusiastic about this role. Exposure to prospective mentees remains an important aspect of this process. Offering preclinical students or residents the opportunity to shadow in the emergency department or spend time together outside the hospital is an effective way to share enthusiasm about our specialty and be available to prospective mentees.

Students at medical schools without EM residency programs, international students, house staff in foreign countries, and residents practicing in non-EM settings have several opportunities for exposure to EM faculty and mentoring. Advising may occur by offering information and resources related to career selection, transition to, entry into, or success in EM [41].

SAEM (www.saem.org) has several resources related to mentoring throughout its useful website. Information provided by our specialty's leaders related to research ethics, junior faculty research (including a nice presentation on mentoring a junior investigator through a time-limited research project), mentoring medical students is available [2].

The Clerkship Directors in Emergency Medicine (CDEM), an academy within SAEM, has assumed responsibility for the virtual advisor program (e-Advisor) for medical students. Students interested in participating have access to a list of volunteer EM faculty members willing to share information about our specialty. Students are expected to initiate relationships with e-Advisors electronically and may maintain contact over the Internet or arrange the opportunity to speak by phone or meet in person (at an EM conference or the mentor's institution). The information exchanged between these relationships must remain confidential because students should be comfortable asking questions and sharing concerns they may have about our specialty, their application (including their personal essay and curriculum vitae), their competitiveness, or suggested strategies to match in EM residency programs. Because the e-Advisor program is intended for students in medical schools without EM residencies or EM faculty, especially those considering careers in EM, it is possible

that a few students may decide against training in EM. This decision should not be considered the mentor's failing or the result of problems with the guidance provided. Virtual advisors can answer questions about careers in EM; rotation recommendations; the residency application process; residency programs; the competitive nature of our specialty or the mentee; planning the final year of medical school; research or writing suggestions; whom to approach (and how to do so) for letters of recommendation; and personal, financial, and other important topics [42, 43]. These interactions may develop into a much more intense mentor–mentee relationship over time, in which the mentor continues to offer advice and support, while watching over the progress of their mentee's training. The responsibilities assumed by a mentor become far greater as this relationship develops, should the student desire to continue the relationship.

The Emergency Medicine Residents' Association (EMRA, www.emra.org) has a Student Mentorship Program available to its members, in which residents in training programs around the country serve as mentors electronically to students who request mentorship. This program has been successful because EM residents are in a unique position to answer confidential questions about life as a resident, the benefits and challenges of residency, and factors to consider when choosing our specialty. This relationship with mentors provides additional guidance for students considering EM as a career choice.

The American College of Emergency Physicians (ACEP, www.acep.org) has added a Mentor Program to its Careers in Emergency Medicine section. This program has developed explicit guidelines for those qualified to serve as a mentor. Their goal is to complement the valuable service that EMRA's Student Mentorship Program provides as residents transition from training to full-time practice. ACEP's program recognizes that the experience of its mentors will become more relevant to younger physicians (becoming older physicians) in their everyday practice over time.

The American Academy of Emergency Medicine (AAEM, www.aaem.org) has a very active Young Physicians Section Mentoring Program. This virtual mentoring program provides an excellent opportunity for young physicians to interact with peers actively involved in community practice or academic EM from different regions of USA. Registering to either find a mentor or become a mentor is easy. When you register, the site asks, "How many mentees or mentors (one–four) you are interested in having?" Registering to find a mentor asks you to provide your reason for wanting a mentor (applying for a new position, moving to a new place, recently graduated from residency, or other [with free text]). Administrative staff and leadership "match"

members of the AAEM Young Physicians Section Mentoring Program based on both parties' answers to these questions.

Internationally, resources for encouraging and fostering mentoring in EM are growing. Several examples of resources currently available through EM organizations include

ACEP's Section for International Emergency Medicine:

www.acep.org

African Federation for Emergency Medicine (AFEM):

www.afem.info

Emergency Physicians International (EPI):

www.epijournal.com

European Society for Emergency Medicine (EuSEM):

www.eusem.org

Global Emergency Medicine Initiative (GEMI):

www.globalemi.org

International Emergency Medicine Fellowship Consortium

www.iemfellowships.com

International Federation for Emergency Medicine (IFEM):

www.ifem.cc

SAEM's Global Emergency Medicine Academy (GEMA):

www.saem.org

These are tremendous resources for emerging EM educational programs and provide information to mentors, mentees, and clinicians related to education, research, faculty, and EM systems development.

Goals of mentoring

One goal of mentoring is to facilitate the acquisition of skills and knowledge required for long-term academic productivity and professional satisfaction (Table 4.8). A mentor's primary goal is to prepare a student, resident, or junior faculty member for future career success. However, just what *success* is must be addressed because this definition generally differs between parties. Clear yet flexible definitions should be exchanged between mentee and mentor to remove any ambiguity. Furthermore, a mentee's definition of success is likely to change over time, as will the mentor's.

Career guidance

Guidance related to career selection typically starts with medical students in the university setting. It may begin even before medical school, with prehospital care or clinical exposure (as an emergency patient or family member of a patient), from a volunteer or work

Table 4.8 Mentor topics.

Career choice, including fellowship training, academics, or community practice
Coursework, especially clerkships and electives (emergency medicine and other)
Residency application process and Electronic Residency Application Service (ERAS), including personal essays and advice regarding letters of recommendation
Residency programs
Clinical issues, including interpersonal skills and interacting with physicians, nurses, consultants, and staff
Medical errors and quality improvement
Patient safety
Ethics and professionalism (dealing with difficult situations)
Academic advancement, including research and administrative roles
Career development and satisfaction
Financial advice
Wellness, balance, and other life skills (including family issues and sleep)

position in an emergency department, or as part of a formal program offering hospital exposure. One of the best approaches to mentoring medical students who are considering careers in EM is to become familiar with student-related issues [41, 43–55]. Faculty members experienced in advising and mentoring students with the application process, during postgraduate training, or on career planning, satisfaction, longevity, and wellness have valuable information to share. Medical students often select their careers during exposure to clinical rotations—perhaps their most formative time. Often, students enter medical school with a predetermined career trajectory, only to become disillusioned during their clerkship experience in that particular area. This situation results in a tremendous sense of loss (or relief) for students and creates the need for them to quickly gain information about a different area of interest. EM often fills this void because it may offer enough variety or an aspect of that initial career trajectory to stimulate interest. It is at this vulnerable yet time-sensitive crossroads where strong mentorship by EM faculty is crucial. One challenge of mentoring in EM with respect to career guidance occurs when a student decides during the clerkship in his or her final year of medical school (a few months before the National Resident Matching Program [NRMP], known as the “match”) that our specialty is a “perfect” fit. This often results in an intense need to gather as much information about EM as quickly as possible. This short window of time requires preparation for interviews, the application and personal statement, rearranging clinical schedules, starting a research or writing project, and other activities that will make them more competitive in EM. Developing interest in EM by a medical student at any time (even late in medical school) should not be considered negatively by a mentor.

It is quite positive, yet it is likely to be challenging for mentors and students. Assisting with career planning as best as possible (without guarantees) is an important role of a faculty mentor.

For medical students interested in a career in EM, mentoring topics might include the number and location of EM rotations, when (and how) to schedule clerkships, how to get the most from each rotation, and how to be outstanding during the clerkship [46, 55]. It is equally important to encourage students to engage in extracurricular activities during medical school, especially those involving leadership and volunteerism. It is essential to help plan non-EM electives during the remainder of medical school and to discuss research projects, the merits of research electives, and international experiences. Many students prefer to train in geographic areas other than their medical school for a variety of reasons; therefore, discussions should be held about programs and audition rotations in these regions. Individuals who express interest in training away from their medical school should be supported (and these conversations should remain confidential). The residency interview process is extremely important to discuss with medical students; consider offering a mock interview with practice interview questions (Table 4.9).

Table 4.9 Topics to mentor medical students.

How many clerkships and where to schedule them
When to schedule emergency medicine clerkships
Assistance with their entire final year schedule
Opportunities within emergency medicine
3- vs 4-year emergency medicine training programs
Fellowship training pros and cons
Short- and long-term goals
Realistic appraisal of the benefits, rewards, frustrations, and difficulties of emergency medicine practice
Review of personal statement and application process
Mock residency interview
Career satisfaction and longevity
Introduction to the political climate within our specialty
Role of organized emergency medicine
Pressures influencing our practice (internal and external)
Boarding and overcrowding
Workplace safety (violence, occupational exposure, etc.)
Circadian rhythm disruption
Burnout
Honest assessment of a student's abilities and potential (competitiveness)
Number of programs to apply and which programs to consider
Appraisal of success in the match and beyond

Based on [47–55].

Resources should be recommended or made available to all parties interested in EM careers whenever possible. These include published literature, student and EM organization addresses, and Internet resources. Printed materials or a textbook can be made available to students during their clerkship or to a mentee during a mentoring session.

In USA, most residents training in any specialty are required to have a dedicated EM experience. Often, residents use this time to catch up on social opportunities, sleep, or reading in their specialty of choice. It may be challenging to motivate residents from other specialties to become excited about EM. When they do feel enthusiastic, the right resident–faculty pairing might result in an opportunity for mentoring, as well as a change in the resident's specialty choice. This decision should be managed carefully, as it may result in additional stressors and pressure from faculty and peers within the resident's original discipline that are not anticipated. It is also likely that many house staff in countries outside USA may be looking for exposure, mentoring, and career guidance on training in or transitioning to EM. Again, this should be carefully managed and closely monitored, while providing as much information as possible to allow trainees to make wise decisions about their future.

Mentoring residents and junior faculty is equally important for career success and the future. It is possible that someone will approach a mentor because they have doubts about their career choice (that EM is not for them). This is challenging for both parties but demonstrates that the mentee has trust in the mentor. Confidentiality is paramount, unless you have the mentee's permission to discuss these concerns. Often, the mentee is unhappy with his or her personal situation, such as a problematic relationship (or the absence of one), geographic location, financial indebtedness, or the time of year or weather, and blames EM for this dissatisfaction. Other times, the challenges and stress of EM practice are responsible for problems in these (or other) areas of their life. It is important that mentors remain neutral, listen carefully, and offer suggestions or recommendations (if desired) but are careful not to pass judgment about or express disappointment in this individual's change of heart. It will be challenging enough for this individual to approach you, especially if the two of you already have a successful mentoring relationship; the mentee might feel he or she is disappointing you or letting you down. If a resident or junior faculty member changes direction in career goals or does not complete stated objectives related to prior intentions, this does not suggest that the mentor has failed or the mentoring relationship was not successful. Remember, "success" for the mentee must be defined by the mentee, not by the mentor. It is not necessarily related to a previously stated

(“final”) product. Perhaps the relationship was successful because of the mentor’s ability to help the mentee recognize that something about EM was not right for him or her, allowing the mentee to restart a careful self-assessment of career choice. This is one example of the tremendous responsibility of the mentor’s role.

Summary

Mentoring at any level should be considered an honor and a privilege, not a chore. A healthy mentoring relationship is likely to strengthen a mentee’s resolve for continued learning and self-improvement. Mentors must take the time to encourage, support, challenge, and believe in their mentees. Mentees deserve faculty members committed to their personal and professional growth, even if academic chairs or promotion and tenure committees do not recognize this activity. Ideally, all individuals, no matter how senior, should be in a mentoring relationship to benefit from this integral component of professional development. A successful mentor must remain altruistic, focus on the needs of the mentee, and maintain confidentiality. Defining successful mentoring remains challenging. However, if it is taken sincerely and performed sensitively, passionately, and with dedication and commitment, the likelihood of success is greatly improved. Providing mentees with productive and meaningful mentoring relationships sets an example for future mentors, which is likely to be translated into future generations of successful physician mentors.

Summary points [4]

- 1 Mentoring in EM takes time and is challenging; it is necessary to establish trust, demonstrate commitment, and discuss expectations and ideals.
- 2 Mentoring offers a unique privilege to influence the development of a less experienced individual.
- 3 Mentors should encourage, support, challenge, and believe in their mentees at all times. If they are unable to do so, these reasons should be discussed privately in a safe setting.
- 4 All medical professionals should maintain strong mentor relationships, no matter how senior they are, and have the opportunity to benefit from this aspect of medical education and career development.
- 5 Investing in mentoring will likely influence EM over time; students and residents who receive outstanding mentorship are more likely to develop into future leaders in the EM specialty. Outstanding EM mentors reflect positively on the specialty of EM itself.

- 6 Providing all students, residents, and junior faculty with meaningful and productive mentoring relationships sets an example for and expectation of future mentors.
- 7 The importance that mentoring has for the growing field of international EM cannot be overemphasized. While much remains to be learned about the methods behind establishing and maintaining international mentoring relationships, tremendous growth in the field of international EM is undoubtedly due in part to successful mentoring.

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SECTION 2

Teaching in the Emergency Department and Beyond

CHAPTER 5

Bedside teaching in the emergency department

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A picture is worth a thousand words!

FRED R. BARNARD'S CHINESE PROVERB

Medicine is learned at the bedside and not in the classroom; the best teaching is that taught by the patient himself.

SIR WILLIAM OSLER

Emergency medicine (EM) faculty have the optimal opportunity to teach at the patient bedside on a daily basis. Although typically focused on trainee and medical student education, the audience may also include nurses and ancillary personnel, as well as patients and their families. Regardless of the target, the teaching concepts are the same: be enthusiastic, focus on the learner's needs, and give a concise, clear, focused message.

Bedside teaching is not a new idea. More than 20 centuries ago, Hippocrates' decision to step out of the classroom (actually it was the temple) to practice medicine at the bedside was based on the value of direct observation. Sir William Osler, the father of modern day bedside teaching, felt that bedside instruction was the best environment for physician education [1].

Indeed, the emergency department (ED) is possibly the most fertile ground for bedside teaching in medicine. Twenty-four hours a day it consistently provides unlimited opportunities to see undifferentiated patients with a diversity of disease processes that cross all subspecialties of medicine and all socioeconomic groups. Emergency physicians also have the prospect of interacting with not only a variety of physicians at different levels of training but also virtually the entire

scope of the health care team. Yet, most emergency physicians are experiencing intense pressure to improve the efficiency, documentation, and cost-effectiveness of EM practice. These specific external pressures inherent in EM, combined with other well-known barriers that all clinician–educators face, have resulted in a significant decline in the amount and the quality of bedside teaching. Time spent at the bedside teaching and observing resident skills has dwindled from 75% 30 years ago to 15–20% or less today [2].

What is holding us back: barriers to bedside teaching

Classically, bedside teaching occurred during inpatient ward rounds conducted by academic professors in university teaching hospitals. This environment was a stable one, where patient-centered teaching could be conducted at a calculated pace without interruptions. Unfortunately, in recent years, modern medical education has come to embrace a more didactic format at the expense of bedside teaching for a variety of reasons [3, 4]. Lecture-based curricula are a more easily implemented “passive approach” that requires fewer instructors, less work ethic, and no expectation for “bedside teaching skills.” This didactic approach alleviates instructors’ concerns over the need for an “expert performance” at the bedside and eliminates any unwanted involvement of the patient in discussions about his or her own care, the so-called medical chauvinism. The academic community itself has contributed to this migration by failing to provide faculty development in the critical skill set needed for successful bedside teaching. This is further compounded by the underappreciation of the “value” of accomplished clinician–teachers with regard to promotion and financial support [5, 6]. Finally, time constraints in the ED associated with efficient and effective patient management exert a negative influence on the time spent at the bedside.

Educators can easily overcome these obstacles with some enthusiasm; a little training; a realization that experts can say, “I don’t know”; and a commitment to improving health care in general. Bedside teaching improves everyone it touches, including patients, even if they are not the intended target. The overwhelming majority of patients feel educated and reassured about their illness and their diagnostic and therapeutic plans and appreciate the opportunity to get their questions answered. The impact of direct observation during bedside encounters cannot be understated. Direct observation can positively affect not only history and physical examination skills but procedural ability, professionalism, interpersonal skills, and communication as well [7, 8]. Linking teaching with a visual cue (the patient) is a very powerful

tool that can improve the quality of care provided by the entire health care team. Successful bedside teaching does require some planning and utilization of several attributes and skills that anyone can develop.

The basics: characteristics of effective bedside teachers

Until Bandiera *et al* published their study in 2005 [9], characteristics for effective bedside teaching in the ED were adapted primarily from other practice environments. The personality characteristics of the best teachers are well known: enthusiasm, availability, knowledge, confidence, receptivity, and inquisitiveness (Table 5.1). Unfortunately, personality alone does not guarantee learner success. Heidenreich *et al.* [10] and Bandiera *et al.* [9] examined effective and efficient strategies for teaching in the ambulatory and ED settings, respectively (Table 5.2). A combination of the right personality traits and some easily learned and implemented learning strategies results in successful bedside teaching.

Success begins with enthusiasm and a desire to positively influence the learner. Excellent teachers seek opportunities to teach and share cases even with learners they are not supervising. They plan ahead, developing and utilizing teaching resources to augment their clinical-based instruction. These resources may include case files; electronic depositories of clinical photos, radiographs, electrocardiograms, and research articles; and Web-based teaching sites. They employ and encourage effective interpersonal and communication skills to establish a receptive learning environment and project a supportive, approachable, calm demeanor.

As the shift begins, get to know the learner and ascertain his or her educational needs and focus for the shift. Learner-centered

Table 5.1 Characteristics of an excellent bedside teacher.

Enthusiastic
Available, approachable, patient, calm, respectful, tolerates errors
Excellent listener
Seeks out learner's goals (learner centered)
Knowledgeable but realistic and willing to say, "I don't know. Let's find out."
Actively seeks opportunities to teach
Role model for professionalism, communication, and interpersonal skills, lifelong learning
Effective, efficient, and timely

Data from [9, 10].

Table 5.2 Strategies for effective ED teaching.

Orient the learner by relaying clearly defined expectations of his or her performance
Optimize faculty–learner interaction using optimal interpersonal skills and teaching tools such as the Internet, teaching files, and prepared cases
Provide a clear, concise, focused message (“teaching bite”) and avoid “overteaching”
Provide learner-centered instructions that are prioritized and tailored to the learner’s needs
Promote learner autonomy and facilitate active problem-solving and critical thinking skills through teacher–learner reflection
Teach in the patient’s presence and mentors and reinforce effective behaviors (reflective modeling)
Demonstrate examination and procedural skills with clarity
Improve the environment by ensuring adequate time to teach without interruptions
Provide effective, prompt feedback

Data from [9, 10].

instruction is the single most commonly cited effective learning strategy by EM educators [9]. Relay upfront clear expectations for learner performance. Foster a collegial atmosphere that encourages an open exchange of ideas. This requires being an active listener; teachers should listen more and talk less. Ask questions that promote learner autonomy, critical thinking, problem-solving, and linking of new elements to the learners’ existing fund of knowledge. Ask the learners to commit to their ideas and allow them to make mistakes; this provides an excellent framework for discussion and feedback. Allow time and opportunity for the learner’s self-assessment and reflection. Be knowledgeable but realistic and willing to say “I don’t know. Let’s find out.” Teach how to search for the best evidence and apply it to patient care in real time (knowledge translation). This is a critical facet of mentoring lifelong learning.

Recognize and seize the teachable moment; every case can provide a teaching point. Be creative. When faced with a clinically common or unchallenging case, change the age, alter the setting to a community hospital with fewer resources, or throw in a hypothetical “curve-ball” laboratory or clinical finding. Deliver a clear, concise, focused message (“teaching bite”) at the learner’s level that ensures his or her reception. Avoid “overteaching” or providing an excessive amount of information that obscures or clutters the intended teaching point. If you provide more than one teaching point, provide a summary at the end of your discussion.

Unfortunately, even the most enthusiastic, skilled, well-intentioned teachers are often thwarted in their efforts by “environmental issues.” Frequent interruptions, a full waiting room, and competing demands

on a busy clinical shift all conspire to negate effective learning. Sometimes just finding a quiet place to discuss a case is nearly impossible. Academic faculty must proactively “design” an environment conducive to learning. This begins by ensuring faculty and departmental buy-in by including the provision of quality education in the department’s mission statement. Thus, implementation of “solutions” is supported by a collective mandate. Many academic EM departments practice the “teach-only” attending approach, whereby one faculty’s sole purpose on each shift is to teach and evaluate [8]. Others employ “uninterrupted teaching rounds,” in which they share teaching points from all patients in the ED at the beginning or end of each shift, with only critical interruptions from the ED staff allowed. Most departments have purposely designed “team areas” where cases can be discussed while maintaining patient privacy. Ultimately, the best place for teaching to take place is still at the bedside.

The framework: the experience versus explanation cycle

Enthusiasm and interactive educational skills that enhance active learning and aid the learner in developing critical thinking skills constitute only half the battle. Cox noted that bedside teaching requires developing a framework in advance so that the educational experience will follow. This framework can be divided into two connected cycles: the experience cycle (with its phases of preparation, briefing, clinical experience, and debriefing) and the explanation cycle [11, 12].

Preparation begins with determination of the needs of the teacher and the learner and communicates expectations for the educational encounter. Teachers must recognize the inherent limitations and set appropriate, limited goals for each encounter. Before starting the experience cycle, answer the simple question, what would everyone like to accomplish? This is also the phase during which resources are identified and developed (classic articles, websites, PDA resources, departmental intranet teaching files).

The briefing phase prepares both the patient and the learner for the clinical encounter. It consists of an introduction and an explanation of the purpose of the bedside encounter, a discussion of the ground rules with the learner, and a review of the examinations or procedures that might be performed. The actual clinical encounter provides an excellent opportunity to mentor the performance of history taking and physical examination, demonstrate physical examination findings and procedures, model patient interaction skills, guide and develop critical thinking skills, and provide feedback. As learners become more advanced in their clinical experience and

skill set, teachers, by design, should allow the learner more autonomy and responsibility with regard to diagnostic and therapeutic decision making. The hallmark of an excellent teacher is allowing the exact right amount of learner autonomy while covertly observing patient care to prevent medical error.

The bedside encounter is also a superb opportunity to enlighten patients about their disease process. It provides a chance to explain what testing and therapeutic procedures will be performed and to reinforce and educate them about your plans for treatment and follow-up after discharge. The experience cycle ends with the debriefing phase, which gives the learner an opportunity to answer any “sensitive questions” not raised in front of the patient. The teacher reviews what was learned at the bedside, ensures that the learner received the correct learning points, provides constructive feedback, and devises plans for future encounters.

The explanation cycle begins with reflection and is followed by explication, working knowledge, and preparation for future patients. Reflection allows the teacher and the student to link practice with theory and previous experiences or knowledge, whereas explication examines how medical practice can be improved by advances in biomedical science or current best evidence (practice-based learning). This links the clinical experience with theory and research relevant to the case and brings evidence-based medicine to the bedside by providing an opportunity to assign clinical questions that the learners can use to develop lifelong learning skills and spark future offline learning. The explanation cycle concludes with the “working knowledge” phase, which extracts and solidifies practical knowledge from the clinical experience that can be applied to future encounters.

Several other accepted frameworks are employed to guide bedside teaching. One of the most popular, efficient, and validated methods is the five-step microskills model of clinical teaching, also known as the *One-Minute Preceptor* [13, 14]. In a hectic ED, this model provides a condensed version of the aforementioned experience/explanation cycle model and incorporates many of the effective learning strategies identified by Bandiera and associates [9]. The basic steps are to (i) get a commitment, (ii) probe for supporting evidence, (iii) discuss a teaching pearl, (iv) reinforce what was done right, and (v) correct mistakes. Studies show that this method enhances faculty confidence in learner assessment, improves learner diagnostic accuracy, and results in a more effective, efficient, and desired teaching encounter [14, 15]. Another method employs the six-step learner-centered technique known by the acronym *SNAPPS*—Summarize history and findings, Narrow the differential, Analyze the differential, Probe preceptor about uncertainties, Plan

management, and Select case-related issues for self-study [16, 17]. The SNAPPS format takes the learner beyond the role of “factual reporter” and into the critical thinking role of “synthesizer” by enhancing expression of diagnostic reasoning and uncertainties. These and other methods are discussed further in other chapters.

Implementation: the art of bedside questioning

Bedside teaching should be an interactive session that maintains *active* learner participation. Passive learning occurs when teachers talk too much, ask close-ended questions, or answer their own questions. Passive learning not only is ineffective and inefficient but also conveys the assumption that the learners are disinterested. Envision yourself as a coach and a facilitator who promotes critical thinking by the student. Teaching critical thinking skills will have more of a lasting impact on learners than other methods, such as “pimping” (asking learners obscure medical questions to see how much they know or do not know). When skillfully asked, questions should assist the learners in identifying relationships and linking the unknown to the known. Formulate questions that stimulate the teacher and the student to explore ideas and solutions together. One simple method that can be implemented is known as the *five whys*. Borrowed from a method used to assist with root-cause analyses, the “five whys” is a simple question-asking technique that explores the cause-and-effect relationship underlying problems, whereby the “next why” is based on the previous answer. Expert clinical teachers may employ “guiding questions” to make the learner focused, promote understanding, probe their reasoning, crystallize an idea, or challenge a conclusion (without confrontation) (Table 5.3) [18]. These questions focus on synthesis and interpretation of knowledge as opposed to a simple recall of facts. The aforementioned SNAPPS method is a perfect example of this process. It encourages learners to commit to and express their diagnostic reasoning as well as uncertainties about the case. This lays an incredibly fertile foundation for the development of critical thinking skills as facilitated by the teacher. In addition, seeking a commitment from the learner allows more focused and effective behavior-changing feedback.

Clearly, the style in which questions are asked has a tremendous impact on the learner’s perception of a positive or a negative learning climate. Questions that are unexpected, confrontational, accusatory, or used to make a student feel bad create a negative environment and hinder learning. This is also true of teachers who exhibit negative body language, ask “rapid-fire” questions, or continually interrupt their student’s answers.

Table 5.3 High-yield questions (focus, probe, prompt, challenge).

Why do you believe that to be true?
What have you learned so far?
How did you reach that conclusion?
What is your reasoning behind that question?
What led you to that decision?
What are some other possibilities that would explain that presentation?
Why is that information important?
Why is one approach better than another? Are there other approaches that have not been considered?
What will happen if you do/do not do X or Y?
What is the association between those two findings?

Data from [11].

In contradistinction, teachers who seek to develop critical thinking and successful learning ask meaningful, probing questions in a non-threatening, positive climate. Their questions stimulate and challenge learners to analyze, solve problems, and think independently [19]. This interactive collegial discussion should be followed immediately by formative feedback. Adjectives applied to effective formative feedback include timely, relevant, descriptive, verifiable, focused, and constructive. The exchange should include both positive and negative reinforcements. A commonly cited method is the “Sackett Sandwich” (positive-negative-positive). Finally, the “art” of questioning allows teachers to convey their interests, spread their enthusiasm, and continue their own lifelong learning.

As teachers, the types of questions we ask determine the level of intellectual challenge for the learner. Convergent or close-ended questions require little critical thinking, whereas probing questions require independent assessment, critical analysis, and problem-solving skills. A blend of convergent, divergent, and probing questions will make bedside teaching an active, challenging process. On average, instructors wait only 2–3 s after asking a question before answering it themselves. Studies have shown that the optimal wait time is actually 17 s. Although this seems like an eternity, teachers must recognize variables that influence expert–novice interactions.

Be cognizant of the fact that expert and novice thought processes take very different pathways through the brain. Experts jump from A→E quickly with little conscious thought process in between; novices think more concretely in a stepwise A→B→C→D→E process that is much slower. For this reason, experts who have long forgotten the drawn out stepwise links have a difficult time explaining their

Table 5.4 Characteristics of Novice versus Expert Thought Process.

	Novice	Expert
Knowledge of subject	Sparse	Detailed
Experience	Limited	Extensive
Pattern recognition	Slow	Rapid
Memory	Isolated facts	Concepts

thought process and conclusions to novices. Consider the descriptors in Table 5.4 for the novice versus expert thought process.

Experts in bedside teaching recognize this processing gap and take time to explain their thought process and decision making in a stepwise point-to-point fashion [20].

Closure: effective feedback as it relates to bedside teaching

The bedside experience should end with effective, formative feedback. Many researchers have demonstrated that consistent, objective, and timely feedback on performance is the educational intervention that is most likely to produce a meaningful change in the behavior of professional trainees [21]. Yet, errors are repeated 70% of the time after feedback is provided. Students have poor recall of the “corrective” message in postencounter feedback. Feedback is rarely provided to physicians-in-training, nurses, or prehospital care providers: less than 10% of interactions between students/residents and patients are followed by feedback, and less than 20 s of the average 4-min “teaching” encounter in clinical settings is used to provide formative feedback [22]. Finally, students and faculty have different perceptions about what should be included in feedback.

Feedback is the backbone of formative evaluation and should occur continually in clinical teaching. It is real-time “coaching” that occurs in the immediate proximity of the action or behavior being observed. When delivered correctly, it is the most effective tool for reinforcing good behaviors and extinguishing negative ones. This sounds so easy and straightforward: how do we fail?

Unfortunately, first and foremost, teachers were never taught how to give effective feedback. Feedback commonly lacked a vital component, thus rendering it ineffective. Criteria used to define effective feedback include its objectivity, consistency, timeliness, relevance,

Table 5.5 Feedback tips.

Allow eslf-evaluation initially
Raise issues with questions instead of telling
Do not overwhelm the learner with information (1 message = 75% retention; 2 messages = 50%; 3 messages = 25%)
Do not personalize the message—focus on changing behaviors, avoid inflammatory language, use neutral language, and use the collective “we”
Structure the feedback to include both positive (reinforcing) and constructive (behavior changing) comments; a commonly cited method is the ego or “Sackett” Sandwich
<ul style="list-style-type: none">– Praise the learner for appropriate responses or procedures performed well– Identify performance problems and correct them– Finish the conversation with a positive or encouraging overall summary
Remember the four <i>P</i> 's: <i>Praise in Public ... Perfect in Private</i>
Use focused concrete feedback—give your reasoning, and not just the answer
Ask students to summarize the “take-home messages” received during feedback

and clarity. It should be descriptive, verifiable, and focused enough to have a defined impact on the learner (Table 5.5).

The method of delivering feedback may have been flawed and thus the information went unheard. Giving feedback is an interpersonal skill that requires five key ingredients from the teacher: caring, trust, acceptance, openness, and concern. Feedback presented in this manner minimizes defensiveness and maximizes the learner's ability to change behaviors. Feedback that is poorly defined or cluttered is also often missed.

If the behavioral objectives were ill defined, it is difficult to give focused, meaningful feedback. Behavioral expectations must be identified ahead of time so that the learner clearly understands what behaviors the teacher is observing. This provides the basis for descriptive feedback that is focused and specific enough to reinforce positive and alter negative behaviors.

Faculty members might be hesitant to provide constructive criticism because they fear loss of camaraderie or unwarranted negative assessment of their teaching capabilities because they provided critical but honest feedback. They may also withhold feedback because they want the learner to initiate self-assessment or because they are worried about hurting the learner's self-esteem. A classic problem in the ED, where a learner may interact with multiple teachers in the same shift, is the assumption by one faculty member that the negative behavior occurred only during their interaction with the student or that another faculty member was going to provide the formative feedback. In either account, an opportunity to modify behavior is missed and the inappropriate action continues unimpeded.

Thus, the first step in developing constructive feedback is defining expectations or observable standards of performance that are realistic and clearly communicated to the learners. Next, the teachers must assess learners' performance based on focused, objective measures. The best method of evaluation is direct observation at the bedside using a tool such as the Standardized Direct Observation Assessment Tool developed by the Council of Emergency Medicine Residency Directors (CORD) [8]. Other methods that are less reliable include Objective Structured Clinical Examinations (OSCEs), anecdotal report from other teachers, self-report by the student, indirect assessment, and written examinations. The third and potentially most important aspect of providing effective feedback is identification of causes of substandard performance. Without this knowledge, it is virtually impossible for the teacher to design a plan for remediation that will improve the learner's performance. Common causes of substandard performance include a skill or behavior that was never learned or learned incorrectly, skill deterioration from lack of use (i.e., it became "rusty"), lack of incentive (e.g., student's perception of effort vs likely reward), or environmental issues (e.g., the clinic operation hinders a student's performance). Once identified, the teacher can intervene by providing focused feedback alone, feedback and a refresher, more practice, or extensive retraining (remediation).

Summary

Every case has a teaching point, and every shift presents potentially dozens of "teaching moments." Taking advantage of these opportunities requires the close attention of the teacher to "seize the moment." By employing the skills and attributes of successful teachers in an enthusiastic and efficient manner, EM clinician–educators can have a dramatic impact on a variety of learners. Search out the "teaching moment." Have a number of "teaching bites" and other resources readily available to use when such moments arise. Make sure that your "teaching bite" is focused, easily digestible, and targeted to the learners' level of understanding and their needs. Learn to recognize your learner's knowledge gaps and exploit them for teaching. Guide learning with high-yield questions that require synthesis and interpretation. Consider employing methods such as the One-Minute Preceptor or SNAPPS to facilitate efficient questioning and critical thinking. Provide clear, constructive feedback that reinforces the appropriate performance and extinguishes the negative. Most of all, enjoy the opportunity to learn from your students/trainees at the bedside as much as they learn from you.

Summary points

- 1 *Barriers* to bedside teaching include frequent interruptions, time constraints, and the perceived lack of “value” assigned to teaching by promotions committees.
- 2 *Basics* of successful teachers include being enthusiastic, prepared, learner centered, and willing to “seize the teachable moment.”
- 3 *Framework* of teaching includes the experience and explanation cycles:
 - a Experience cycle
 - *Preparation*—what do you want to accomplish?
 - *Briefing*—introduction, explanation of purpose, ground rules, and review of examinations or procedures to be performed.
 - *Clinical encounter*—the actual patient encounter.
 - *Debriefing*—occurs after the encounter.
 - b Explanation cycle
 - *Reflection*—on theory and previous encounters.
 - *Explication*—how practice can be improved through evidence-based medicine.
 - *Working knowledge*—deriving knowledge to be applied to future encounters.
- 4 *Implement* your program through active learner participation to *focus* the learner, *promote* understanding, *probe* his or her reasoning, *crystallize* an idea, and *challenge* the conclusion.
- 5 *Close* the session by giving effective, prompt feedback.

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CHAPTER 6

Teaching invasive medical procedures

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Teaching medical procedures may be one of the most rewarding aspects of medical education. Physicians-in-training place a high value on mastering clinical procedures and often link their confidence to their procedural skills. Traditionally, physicians have learned to perform medical procedures by the “see one, do one, teach one” method, in which a learner observes a procedure, performs one under supervision, and is then considered sufficiently skilled to teach it to others. Furthermore, the majority of such procedures are taught by junior- and senior-level trainees who may not have mastered their technical or teaching skills. This approach to procedural education carries inherent flaws. The purpose of this chapter is to provide the necessary theory-based framework for successfully and efficiently teaching psychomotor skills in the emergency department.

Prepare to teach and learn

Before instructing anyone in the performance of a procedure, it is important to provide an opportunity for the student to prepare to learn that procedure. This phase of learning should occur in a more didactic format, aside from the laboratory or patient bedside where the actual mechanics of the procedure will be performed. The goal of this preparatory time is to ensure that the student understands the large amount of prerequisite information needed to perform procedures appropriately. This information includes a review of the indications and contraindications for the procedure, the instruments and the

tools used to perform the procedure, and the expected outcome of the procedure. In addition, learners should take time to review the risks of any procedure they perform, including the possible complications and how to manage them if they occur. A portion of this preparation should focus on the process of obtaining informed consent as well as documentation of the procedure [1, 2].

Whether procedural instruction is a planned activity (e.g., as a cadaver/skills laboratory or simulation session) or an impromptu bedside opportunity, the learner should be asked to be prepared by acquiring information regarding the procedure before its performance. Instructors can use any of several methods to prepare students for procedural learning. Traditionally, learners have been assigned chapters in a textbook to review before an instructional session or a clinical rotation where that procedure is frequently performed. Other approaches include distribution of information packets, computer programs, or videos containing the information they would like the learner to have mastered before the teaching experience. Although these methods of preparation ultimately provide the learner with the information required, they are passive learning. Rather than providing all of this background information directly, instructors can foster interest and more sustained learning if they give students the necessary tools to find this information through their own exploration. Physicians-in-training are often able to uncover and retain more information if they consult multiple sources, including colleagues, texts, nurses, and Web-based media. The prospect of learning and performing a new procedure typically serves as adequate motivation for this active learning to occur. In this case, the instructor's role is to provide some guidance regarding sources of reliable information and to review the information acquired, leading a discussion regarding what they have learned and highlighting key points. Even when a bedside procedural teaching opportunity arises with little warning, as long as time permits for patient safety, the student can be directed to take a few minutes to review the key components and details of the procedure in a text or video recording before participating in the tactile learning experience. The teacher should maintain an online or readily accessible repository of videos and texts of common procedures for quick reference in these cases [1]. Many teaching institutions have developed and evaluated computer-assisted modules that incorporate images, short video clips, and instructional texts. Ricks and colleagues [3] demonstrated that students with access to computer-assisted material had a significantly better knowledge of the emergency procedures being taught than controls. Professionally developed online educational resources are commercially available, typically with access fees.

While students prepare to learn a procedure, the instructor must prepare to teach it. This involves task analysis, a skill in which the instructor breaks down the procedure into small, more digestible components for teaching purposes. For example, when teaching the placement of a central line, one of the microskills that needs to be acquired before attempting the procedure is the ability to draw back on a syringe using a single-handed method. Without accomplishing this smaller component of the motor skill, the physician will never learn to place a central line independently. As this example demonstrates, instructor preparation can be challenging because many of the microskills required to perform procedures are taken for granted once the procedure is mastered. Therefore, instructors must take the time to deconstruct the components of the procedure in preparation for the learning session and create a task analysis. They should develop a clear and concise order for the process being taught in digestible steps, without taking any previous knowledge or experience for granted [4, 5].

Another component of instructor preparation involves the learning environment itself. Maximization of the learning experience is highly dependent on the setting. As such, when planning to provide procedural instruction at the bedside, instructors must take the time to prepare not only the learner but also the subject. For bedside learning with awake and alert patients, this step is imperative. In addition to informing the patient that a less experienced trainee will be involved in the procedure, it is wise to advise the patient that the procedure will be closely supervised by an experienced teacher and that instructional discussion will occur while it is being performed. This lessens the likelihood that the patient will be surprised or apprehensive when he or she hears the instructions being given. In addition, preparing the patient allows the instructor to choose patients who seem more receptive to participating in the learning environment, thus creating a positive teaching experience for all involved [1].

When the procedural experience involves cadaveric or nonhuman subjects, this phase of the preparation should focus on ensuring that the physical space and environment are conducive to the type of teaching that is planned. Attention is required to ensure the safety of the procedure with respect to communicable diseases and proper disposal of sharp medical tools and biologic materials. Finally, care must be taken to ensure an adequate instructor-to-student ratio. Ideally, there will be fewer than four learners per instructor. In addition, it is imperative that the learners are at the same level of experience to ensure that an appropriate and a consistent amount of guidance is provided.

The process of learning

Although a variety of methods are used for procedural instruction, a process based on the theory of psychomotor learning is often most effective. The long-standing tenet “see one, do one, teach one” does not provide an optimal framework for the learner or the instructor to ensure mastery of a procedure. Instead, a multistep process of learning the procedure and then practicing it with a declining level of supervision and guidance is more effective (Table 6.1).

This process starts with conceptualization of the procedure, which entails understanding the reasons for performing the procedure as well as its risks and benefits, as described earlier. Once conceptualization has occurred, the subsequent step is visualization of the procedure. As the instructor models the procedure in its entirety, the learner is a silent observer, taking mental notes of the instructor’s actions. The instructor serves as a silent model during this step of the learning process, demonstrating the expected performance once skill mastery is achieved. Visualization can occur at the bedside, in the cadaver laboratory, or using filmed videos.

It is important to ensure that the learner is positioned to observe the procedure from the same perspective from which he or she will perform the procedure. For example, placing the learner at the patient’s side to observe an endotracheal intubation would be suboptimal. Rather, the learner should be positioned with the same visual orientation as the person performing the procedure in relation to the patient to visually record each step from the perspective in which it is performed. Video-assisted laryngoscopy is an even better example of the significance of the learner and teacher having the same perspective. Ayoub and associates [6] described a study in which students who were trained to intubate using a video-assisted laryngoscope were remarkably more successful at direct laryngoscopy

Table 6.1 Steps in the process of learning a procedure.

Conceptualization—understanding the reasons for performing a procedure, the overall process, the tools involved, and the risks/benefits
Visualization—observing a demonstration of the procedure, performed in a fluid and competent manner by the master teacher
Verbalization—reviewing a verbal deconstruction of the procedure while it is performed by the expert, with opportunity for interruptions and clarifications
Guided practice—performing the sequential steps of the procedure under the supervision of an expert physician

intubation than their cohorts who had been trained with the direct laryngoscopy technique.

Once the basis for the procedure is understood (conceptualization) and the learner has been given a model of the procedure (visualization), the instructor deconstructs the procedure for the student while performing it a second time, verbally noting each step taken and the skills required for it. This process is known as *verbalization*. Accurate task analysis before the instructional session ensures that the instructor presents the procedure in a clear, coherent, and comprehensible manner. Each portion of the procedure is described verbally and is performed physically simultaneously. This can be accomplished in a face-to-face interaction or using video prepared in advance. During this step, the learner is encouraged to interrupt the procedure to ask questions or make clarifications of the information being communicated. Although a prepared video may allow demonstration of the procedure with verbal cues, the particular components of the procedure are best discussed in a small group or in an individual, face-to-face interaction. Subsequently, the learner can be asked to narrate the procedure while the instructor performs the procedure a second time. This ensures that the learner conceptually understands the actions involved and the order in which they should be performed [2, 7].

Multiple faculty members may be involved in teaching procedural skills to the same group of learners, at the bedside as well as in a simulation or cadaver laboratory, and it is of utmost importance that the procedure is demonstrated and performed consistently. Although clinicians who have mastered clinical procedures often have their own nuances or specific tricks of the trade to offer trainees, these should not be incorporated into this stage of the learning process. Therefore, it is important to be cognizant of the basics of a procedure, as some instructors may have to alter their “usual” method for performing a procedure to deliver a more standardized educational experience. Once the standard method is mastered by the learner, particular variations and shortcuts may be taught, but if taught prematurely, these will only confuse the novice learner and lengthen the time required for motor learning of the procedure [4].

Armed with the visual model of the procedure and the ability to verbalize the steps involved, the learner is then observed performing the procedure on the model. This process is known as *guided practice* [3]. To decrease learner anxiety, this step is often performed initially on cadavers, simulation models, or a willing volunteer rather than a patient. The learner may be instructed regarding separate steps of the procedure one step at a time or may attempt the entire procedure under guidance. If the instructor chooses to review certain steps of the procedure, they should be reviewed in the order in which

they are performed to maximize the motor-based learning involved. Learners should be able to verbalize each step as they perform it and should be observed carefully by the instructor for any errors [4].

When an error is identified, it is optimal to have the instructor place his or her hand on the trainee's hand to stop the incorrect action and physically redirect the student to the correct motor action while providing verbal instruction regarding the proper method. It is important that learners be told that this will happen and for them to expect this hand-on-hand contact. One common pitfall is allowing learners to perform procedures with errors and then providing feedback regarding those errors after the procedure has been completed. The idea is to stop the error before it is imprinted in the learner's motor memory. Therefore, as the instructor places his or her hand on the learner's hands, redirecting the student to the accurate motor skill, the learner is prevented from incorporating an incorrect movement into his or her motor memory [4].

Guided practice is critical to skill acquisition and mastery. Time should be provided for the student to practice the procedure repeatedly under the guidance of an instructor, who redirects and provides feedback when necessary. As the learner becomes more comfortable with the procedure, demonstrating increased skill competence, the instructor's involvement in the procedure should decrease until the learner is essentially performing it without assistance. Practice without guidance can precipitate errors and result in imprinting of inappropriate actions, which is dangerous to patients and a disservice to the learner. Immediate feedback, both positive and negative, is invaluable throughout the learning process. More specifically, effective feedback is performance based, highlighting portions of the procedure that were done well and pointing out areas for improvement, with specific tips on how to improve the skill attempted [1, 5].

There will be occasions when the learner fails to perform the entire procedure successfully. It is important to create a positive learning experience in this scenario. One effective way to educate the learner regarding mistakes is a face-to-face debriefing session. It is most beneficial if this discussion takes place immediately after the procedure. In most cases, the learner will have a high level of self-awareness and be able to identify areas for improvement. The instructor should provide feedback in a positive way, first emphasizing the correct steps performed, then providing a constructive critique of any errors in technique, and finally encouraging the learner to reattempt the procedure with guidance. Once a basic procedure is mastered by a learner, the next step in skill acquisition is to present variations on that procedure. It is in this final step that learners can be introduced to the shortcuts or varied methods that instructors use in

their daily practice. They should be challenged to apply the procedure in difficult situations and learn alternative techniques to accomplish the desired outcome [7].

Putting theory into practice

In reality, many physicians-in-training are still learning procedures within the framework of the “see one, do one, teach one” model. The transition to a more formalized, effective method for learning key procedural skills is difficult, as it requires more preparation on the part of both the learner and the teacher. In addition, the time required to teach and supervise learners practicing new procedures is considerable. The recommended teaching methods can be implemented in a variety of ways, including computer software models, low fidelity model practice, simulation laboratories, cadaver/animal laboratories, and bedside teaching on patients. Each of these teaching environments, when used within the framework of the teaching theories presented earlier, can provide an opportunity for effective learning.

At the most basic level, simple teaching models are most effective when teaching the core motor activities required for a procedure. These models are often less expensive and more portable than simulators or cadavers, and they carry no risk of errors compared with bedside teaching. As one study conducted by a surgery department demonstrates, using a simple model such as a pig thigh to teach a surgical procedure led to significant improvements in overall performance by residents. The authors of this study noted that because of the constraints of decreasing operating room time and the increasing liability concerns about allowing junior residents to practice on and learn from live patients, residents were not receiving adequate training in certain procedures. Therefore, a brief training session was developed using the model of a pig thigh, with a pre- and postsession evaluation. Residents demonstrated a significant increase in their postsession scores, regardless of their level of training or experience with the procedure. The success of this basic teaching technique was linked primarily to the quality and availability of immediate feedback for the learners as they practiced the procedure during the session. As noted by the authors, a simple tool, such as a pig thigh model, provides an opportunity for new learners to practice a procedure in a safe, inexpensive environment with close mentoring before direct patient contact in the operating room [8].

A more costly, but increasingly popular tool for teaching multiple aspects of medicine, including procedural education, is the simulator model. Benefits of using this model versus a human model include increased safety, the ability to practice the same procedure multiple

times in a single session, and the option of exploring the consequences of errors without the risk of harm to a patient. Although cadavers may provide the best approximation of the tactile and visual cues of a human-based procedure, technologic advances in materials sciences and computer-based models have provided a close approximation in many cases. In addition, the interactive capability of a simulator model allows the instructor to create increasingly challenging circumstances for the learner. For example, a new learner may initially gain mentored practice by placing a central line in a perfectly still, sedated simulator model. As the learner becomes more proficient, the simulator may be manipulated to present a patient with low blood volume and easily collapsible veins to present a realistic challenge to the learner, thereby encouraging advanced skill acquisition. As with any other teaching model, the key component that results in successful skill acquisition is guided, consistent practice with a decreasing role of the instructor in the actual performance of the procedure as the learner becomes more proficient [9].

Similarly, the cadaver laboratory provides an opportunity to learn and practice invasive procedures without posing any threat to the patient. The limitations of this modality include the availability of human cadavers and the expense involved. Use of cadavers provides accurate human anatomy with all the natural variations. Palpation of landmarks and subtle anatomic differences provides a more realistic experience for the learner. At times, complications that cannot be recreated in a simulator model lead to better education. Examples include the inability to advance a guidewire in a cannulated vein and the need to suction an airway while teaching direct laryngoscopy. There are also disadvantages to the anatomic and pathologic differences among cadavers. For example, venous thromboses can prevent flashback in central line access attempts and pleural adhesions can complicate placement of chest tubes. These variations can result in inconsistent learning among a cohort of students. Finally, the safety of all participants must be ensured by screening donors for communicable infections.

An alternative to using human cadavers, especially if there are cultural barriers to their use, is the animal laboratory. Small domesticated animals such as sheep and pigs have historically been used to teach invasive procedures. The animals are anesthetized during the procedures and subsequently euthanized. The advantage of this laboratory is that blood is circulating, and therefore, the physiologic response to the procedure is real. Conversely, the high cost, logistics of caring for the animals, and legal restraints regarding the use of animals for this purpose can be prohibitive. Furthermore, zoonotic disease processes need to be considered. Table 6.2 lists invasive procedures that can

Table 6.2 Examples of invasive procedures that can be performed on human cadaver or domesticated animals.

Procedure	Special instructions	Instruments
Lateral canthotomy	Simulate proptosis by injecting fluid in the retrobulbar space using a small needle and syringe	Suture kit
Retrograde intubation	Feed the wire from a central line kit from membrane to nose/mouth and intubate over the wire	Central line kit and ET tube
Cricothyrotomy	Simulate bleeding by pouring red paint onto the surgical site during the procedure	Scalpel, gum-elastic bougie, and ET tube
ET intubation	Use direct and video-assisted laryngoscopes. Use cricothyrotomy hole to confirm placement.	Laryngoscope/ET tube
Central venous access	Internal jugular, subclavian, and femoral access in human cadavers; landmarks will not work in animals	Central line kit
Pericardiocentesis	Pericardium can be filled with fluid and food coloring after thoracotomy	Central line kit and ultrasound
Tube thoracostomy	Multiple chest tubes can be placed on each side	Chest tube tray
Thoracotomy	Demonstrate cardiac massage, locating phrenic nerve, performing pericardial window, clamping of descending aorta	Thoracotomy tray
Diagnostic peritoneal lavage	Red food color fluid can be injected into the cavity prior to the procedure	DPL tray
Suprapubic catheter	Fill and distend bladder with a Foley catheter	Central line kit and ultrasound
Arthrocentesis	Multiple joints can be injected with yellow food coloring	Needle and syringe

Videos of many of these procedures can be found at www.umem.org/res_video_procedures.php. ET, endotracheal; DPL, diagnostic peritoneal lavage.

be performed on human cadavers or domesticated animals. In many cases, only an animal part such as a rib cage for chest tube placement or trachea for cricothyrotomy is required.

All the aforementioned settings are effective precursors to bedside procedural learning. As the optimal setting for the advanced learner, bedside teaching provides the opportunity for one-on-one instruction with a master in the procedure on a live patient. Although performance of the procedure can be guided by the expert, it is preferable when the learner feels comfortable with the basic steps of the procedure and has performed it in other settings before performing it at the bedside. Immediate feedback can be provided by both the educator and the patient. Although performing a procedure at the bedside should be reserved for learners who have already been instructed regarding the procedure and practiced it in a more structured setting, other phases of procedural learning can occur at the bedside as well. For example, a medical student who has only read about a procedure can accomplish the visualization phase of learning at the bedside by observing the teacher performing the procedure in a fluid manner from start to finish. Those who have observed the procedure once or twice can be asked to verbalize the procedure and prompt the expert performing the procedure regarding the next step to be taken and how it is to be done. In addition, the learner who has practiced a procedure in laboratory can be guided to assist with certain steps of the procedure, whereas the overall performance is primarily by the teacher. As learners gain experience at the bedside, the number of steps that they perform can be increased until they are able to attempt the entire procedure under direct guidance. In this manner, the bedside can be a suitable environment for a variety of levels of learning procedural skills. The key is to recognize the stage of the learner and create the appropriate, safe experience based on that stage of learning.

Creating a procedural education elective for preclinical medical students

Many educators and clinicians have commented that medical school is the optimal time in physician training to teach basic procedural skills. Because medical students have less direct patient care responsibilities and more time to spend practicing acquired skills, many emergency medicine clerkships have designated space within their curricula for procedural education. Beyond the basic skills learned at the bedside, specific procedural skills sessions using cadavers and simulators are now an increasingly popular way to provide exposure to clinical procedures for the new learners within a safe, well-supervised environment. Even outside the framework of a rotation in emergency

medicine, many medical schools employ the skills of emergency physicians when planning preclinical procedural education sessions for rising second- and third-year medical students.

One inventive approach to this has been demonstrated at the Stanford University in the form of a popular preclinical elective known as *Essential Procedures in Emergency Medicine* (EPEM). The structure of this course is modeled on the principles of motor-based learning presented in the chapter. In summary, educational sessions of 2 hours' duration twice weekly throughout a quarter expose these students to procedural education before their clinical rotations. For each procedure there is a presession reading assignment, an interactive didactic session, followed by a demonstration of the procedure by an instructor, and then guided practice of the procedure. Each student spends a set number of hours in the emergency department under the guidance of physicians and nurses performing procedures on live patients. Finally, in a cadaver laboratory session, more invasive and rare procedures, such as cricothyrotomy, tube thoracostomy, and central venous access, are practiced with expert assistance and supervision [10].

Student evaluation includes a written examination regarding the basic indications, materials, contraindications, and steps for a given procedure, as well as a practical examination in which the student performs certain procedures in front of an instructor while responding to questions regarding that procedure. To evaluate the effectiveness of this course, EPEM students' performance in their clinical rotations was compared with that of their classmates who did not participate in this elective. EPEM students had significantly higher scores on procedural performance during their emergency medicine and internal medicine clinical rotations. In addition, enrolment in the elective exceeded expectations during the years studied, demonstrating that preclinical medical students are very interested in having this type of experience before their clinical rotations. Overall, this course presents a successful example of procedural education for early learners that takes into account the educational theory of motor skills acquisition and uses multiple models for guided practice and learning with feedback. It provides a venue for students to learn basic procedures in a prescribed sequence from master teachers, rather than in the unstructured and often inexperienced hands of residents during their clinical rotations [10].

Assessing competence

There is ample evidence that self-assessment in procedure competency by physicians-in-training is unreliable. Barnsley *et al.* [11]

demonstrated a poor correlation between observed competence and self-reported confidence in junior physicians. Many facets of competence need to be assessed, ranging from understanding the indications and contraindications for the procedure to its potential complications to the actual technical skill required to confirm its successful completion. Some authorities advocate the development of checklists that are comprehensive and universal and that can be used during an observation on an actual patient or a model [12]. Such checklists mimic the task analysis described in the chapter. Conroy *et al.* [13] demonstrated the utility of a critical action list in assessment of skill retention of a task trainer following lumbar puncture training. Ultimately, competence will be ensured by providing ample opportunity for guided practice with appropriate feedback.

Summary points

Teaching procedures are essential to the practice of academic emergency medicine. When based on the principles of psychomotor learning (Tables 6.3 and 6.4), procedural teaching can be both enjoyable and successful for all parties involved.

Table 6.3 Key points in procedural education.

- Be sure the learner understands the basis for the procedure
- Have the learner observe the procedure (textbook, video, live)
- Break down the procedure into small digestible components
- Ask the trainee to verbally describe each aspect of the procedure
- Inform the patient that a student will be involved in the procedure and that you will be giving direction and supervising
- Tell the learner to expect to have an error corrected immediately by redirecting his or her hand or stopping and starting fresh
- Provide regular opportunities for guided practice

Table 6.4 Common pitfalls to avoid.

- Taking the microskills required to perform a complex procedure for granted
- Inadequate selection and preparation of an appropriate learning environment
- Demonstrating a procedure with the observer positioned in a different orientation than that in which the procedure is performed
- Teaching inconsistent, varied versions of the same procedure
- Failure to immediately correct an error during a procedure

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CHAPTER 7

Providing feedback in the emergency department

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Providing quality feedback is challenging for seasoned and novice educators. With that in mind, feedback is an essential part of the medical education process. When delivered in a constructive, non-judgmental manner, the effects can be long lasting. In the right hands, feedback can be a persuasive teaching tool that can help shape the attitude and behavior of the learner. As described by Ende [1], feedback in the setting of clinical medical education refers to information describing a learner's performance in a specific activity with the goal of guiding their future performance in the same or a related activity.

Optimally, feedback includes *descriptive information* and is provided to a learner by an unbiased observer. However, this is a difficult premise to uphold because faculty preceptors are simultaneously charged with the process of evaluation. Therefore, it is important for the preceptor to be aware of the difference between feedback and evaluation [2]. Feedback is a formative process that can occur in real time at the bedside or at some point after a clinical encounter, shift, or rotation. Evaluation, on the other hand, provides a summary of performance as it relates to the achievement of specific learning objectives and may be associated with rendering a clerkship or rotation grade. The charge of evaluation places the responsibility of judgment on the instructor. Although feedback and evaluation are clearly distinct, an overlap exists at times in their form and intent. Both are important for the medical education process and for the learner to move forward.

Keeping the best interest of the learner in mind, the educator's primary goal when presenting feedback should be to provide the learner with an objective assessment of his or her performance. By providing feedback, the teacher should focus on reinforcing a job well done, alert the learner about an area of weakness, and provide direction or a recommendation on how to improve or remediate one's clinical performance [3]. Without feedback, mistakes go uncorrected and good performance is not reinforced. In essence, feedback is analogous to performance improvement. Educational feedback is intended to stimulate a behavioral change in the learner. Focusing feedback on certain personality traits is often fraught with frustration for the teacher and the learner.

As educators, we have an obligation to our learners on professional and ethical levels. The relationship that a teacher has with a learner is analogous to that between a coach and an athlete. A coach, especially one of elite athletes, is an expert at improving performance through directed feedback. As mentors to medical students and physicians in training, we, the teachers, effectively serve as educational coaches. A successful and well-respected coach or teacher will alter his or her feedback style to the individual needs of the athlete or learner, at times supportive, at times cajoling, and, if necessary, reprimanding [4].

The emergency department (ED) can be a challenging learning environment for many reasons. Ideally, trainees would have continuity with their preceptors and there would be ample opportunity for direct observation of a learner's clinical and procedural skills. This is not necessarily the case in the ED, where factors such as constant interruptions, endless unexpected events, high-acuity case mix, and shift work scheduling limit the time available for bedside teaching, direct observation, and preceptor–learner continuity (this topic is reviewed in greater detail in Chapter 2). Because of these barriers, faculty and senior emergency medicine (EM) trainees need to adapt their feedback delivery techniques to the individual learner and to the specific clinical scenario at hand. To ensure that feedback will have beneficial and lasting effects, it is often necessary to first create a comfortable and friendly learning environment. It is paramount to work with learners on a collegial level and treat them in a respectful manner. Long before feedback is delivered, the tone for teaching and learning is set, often early in the course of the student–teacher relationship.

Guidelines for providing effective feedback

Feedback can be readily adapted as an effective teaching tool into the unique educational environment of the ED. The seminal paper

Table 7.1 Ten guidelines for effective feedback in the ED.

- Provide feedback that is positive
- Refer to observations of specific behaviors or actions
- Provide constructive feedback
- Elicit self-assessment from the learner
- Be well timed
- Do not overwhelm the learner
- Provide feedback that is nonjudgmental and nonevaluative
- Make feedback a joint venture
- Incorporate feedback into your teaching
- Assist the learner in developing strategies for improvement

by Ende [1] delineates many of the principles of providing effective feedback in the clinical setting. These techniques, along with others, are reviewed in this chapter. Emphasis is placed on approaches that work well in the ED setting (Table 7.1). The preceptor should have a heightened awareness of the effect of providing feedback in front of a patient. As we provide feedback, we are guiding our learners along an educational continuum from the novice learner to a more seasoned senior resident or junior attending. Regardless of the level of the learners, it is important to provide feedback in a way that respects their autonomy without undermining the patient's confidence in their ability to provide care. An example from my own residency training involves the repair of a laceration on a young child's forehead. The attending physician entered the examination room as I was about to begin the procedure. He recommended that I approach the laceration in a particular fashion. I viewed his recommendations as guidance and feedback on how I should approach the laceration. However, the patient's father viewed this as a reflection of my inexperience and proceeded to question if I was confident in my ability to perform the procedure. Bedside feedback should be delivered in front of the patient or family in a manner that does not detract from the autonomy of the trainee. In some situations, it is better to discuss certain aspects of the procedure away from patient or family or to guide the trainee at the bedside using nonverbal cues.

The points to be kept in mind when providing feedback are discussed in the following sections.

Provide feedback that is positive

Instructors should provide positive feedback with the goal of praising the learner for a job well done, avoiding general statements such as "Good job!" or "You worked hard today!" There is always a time and

place for such comments, for example, after a tough case or at the end of a busy shift. However, comments such as these offer little in the way of substance and are likely to be quickly discarded by the learner. Feedback is more helpful and should certainly have a longer-lasting effect when it includes descriptive comments such as, “You did a really good job today. When we were talking about Mr. Jones, you presented his case in a clear and concise fashion and came up with a focused assessment and management plan. I also liked the way that you explained the diagnosis to him and answered his questions.” The descriptive information emphasizes exactly what the learner did well, reinforcing attitudes and behaviors that are favorable. Positive reinforcement is always beneficial; however, if it is linked to specific behaviors, the feedback may have longer-lasting effects.

Refer to observations of specific behaviors or actions

A key to providing meaningful, long-lasting feedback is focusing on specific behaviors or actions of the learners, not on issues that are unlikely to be modified, such as personality traits. The focus should generally be on what learners do or do not do, as opposed to the learners themselves. Provide feedback about what they did or did not do, not about who they are. At times, it may be necessary to provide feedback to the learner about interpersonal relationships with patients, family, ancillary staff, and others, as this is an important aspect of patient care. If a learner has an abrasive or confrontational personality, focusing on what they do, that is, “I think you could have handled that difficult interaction with the consultant differently, here is how I would have approached it . . .,” as opposed to focusing on who they are, “You were a real jerk with that consultant,” is the better way to provide effective feedback.

Provide feedback that is based on direct observation of clinical performance. Direct observation gives the teacher an opportunity to assess specific core competencies such as interpersonal and communication skills. Being descriptive and specific is an important aspect of providing feedback. For example, if a student generated a limited differential diagnosis for a patient with right lower quadrant abdominal pain, which of the following approaches to feedback do you consider more beneficial? “Your differential diagnosis for this patient was a bit limited” or “In addition to the causes of right lower quadrant pain that you mentioned, because she is pregnant, I would also consider ectopic pregnancy as part of your differential. This is important to always consider in a patient who is pregnant and presenting with lower abdominal pain.”

A key point is that, if possible, feedback should be anchored to behavior. Because of the time constraints faced by emergency

physicians, time for direct observation of learners is limited in a busy ED. As a result, we are at times left with providing feedback on case presentation skills and using these skills as a surrogate for the history taking and physical examination. It is logically easier, often because of time constraints, to provide feedback on the *product* of the patient interview as opposed to the *process* of the interview itself, although the two are equally important. Although providing feedback on aspects of performance such as case presentations is necessary, attention to observations of history taking and physical examination skills can add to the feedback process. This can be accomplished in the ED by observing brief aspects of the history taking and physical examination.

Provide constructive feedback

Properly delivered feedback can provide direction as to how a learner can improve his or her clinical performance [5]. Constructive feedback as opposed to constructive criticism can prevent certain actions or behaviors from being incorporated into the learner's daily routine. The connotation of "criticism" versus "feedback" is particularly crucial when providing feedback that might be perceived as negative. As a result of the inherent difficulty in initiating a conversation about the "negative" aspects of performance, some teachers avoid being direct and forthright with the learner. When "negative" or constructive feedback is necessary for a trainee, an approach that is often recommended is to initiate the session with positive comments, followed by constructive feedback, and conclude with additional positive comments, that is, the "feedback sandwich." Presenting feedback through this approach is more palatable for the instructor to deliver and for the learner to receive. Providing or receiving negative feedback creates anxiety for both the teacher and the learner. However, the goal of providing constructive feedback is to correct observed deficiencies to shape future behavior. This is best accomplished if the teacher reports on actions or behaviors that have been directly observed using language that is both descriptive and specific.

Elicit self-assessment from the learner

An approach to consider when conducting a feedback session, either brief or formal, is to elicit learner self-assessment [6]. This technique can be an excellent icebreaker and can serve as an excellent adjunct or alternative to the classic feedback sandwich. Eliciting self-assessment from the learner can facilitate the feedback process by allowing the learner to express a view of their own performance. This self-assessment usually raises many of the same issues that the teacher wanted to discuss and allows the learner to feel more invested in the process. This approach might bring up other concerns that are equally

important to the learner, which might not have been identified by the teacher. Self-assessment sessions can be initiated by the teacher posing open-ended questions: “How do you think you performed today?” “Is there anything that you could have done better today?” “Is there anything you feel you need to work on?”

Self-assessment is fundamental to the concept of self-directed learning and the maintenance of professional competence [7]. A key aspect of learner self-assessment is the assumption that a learner can accurately assess his or her own clinical performance. As teachers, we must keep in mind that the ability to accurately assess one’s own clinical performance is not a given. In fact, some learners with the greatest deficiencies (those who are the least competent) have poor insight into their own clinical performance [8]. Because of this, self-assessment should not be considered in isolation but should be coupled with feedback based on direct observation, as described earlier. Far beyond the typical challenge of providing effective feedback, the learner who lacks self-awareness regarding his or her own clinical competence presents one of the greatest teacher–learner challenges.

Be well timed

The timing of feedback is critical. To be most effective, it should be given immediately after observing an action or a behavior, as the window of opportunity to comment optimally is relatively narrow. It makes intuitive sense that feedback should be provided when the event is still fresh in the mind of the learner and the teacher. Feedback will have a much less desirable effect, if any, when delivered days or weeks later, after the details of an event are no longer fresh. This is applicable to any number of clinical scenarios, for example, patient interviewing, physical examination skills, case presentations, procedural skills. Suppose you observe a learner examining a patient with suspected pyelonephritis. Afterward, you might tell him or her, “I noticed that when you examined Mr. Johnson, you did not check for costovertebral angle tenderness. It’s always a good idea to check for costovertebral angle tenderness when evaluating a patient with suspected pyelonephritis.” Since the examination just happened, it would be easier for the learner to recall this and resolve to alter this behavior in case of similar patient encounters in the future. Constructive feedback such as this may have lasting effects on the learner if provided shortly after the patient encounter, especially if the feedback is presented in a constructive manner. That being said, there are times in the ED, in the midst of a cardiac arrest or the management of a critically ill patient, when feedback may need to be put on hold, unless it is necessary to provide immediate

corrective action. In situations such as these, it is appropriate to set aside a few minutes after the patient has been stabilized or at the end of the shift to provide feedback.

Do not overwhelm the learner

In the ED, feedback is typically delivered in brief, informal sessions focusing on issues that the learner has the power to change, modify, or improve within the confines of a rotation, such as a discrete clinical skill or knowledge deficit. Brief feedback can be given at the bedside while observing a clinical or procedural skill or away from the bedside at the conclusion of a patient encounter or clinical shift. A key to effective feedback is to provide information in easily digestible portions rather than to inundate the learner with multifaceted information. The approach of brief feedback sessions applies to the ED setting, where many teachable moments are unplanned and unscripted and with time usually in short supply.

Feedback should be nonjudgmental and nonevaluative

For educators, interpersonal and communication skills are as important when providing feedback to a learner as they are when talking to patients and professional colleagues. The language and tone with which the instructor delivers feedback should be nonjudgmental and should convey respect for the learner as an individual. The instructor should not attempt to evaluate the learner's clinical performance or overall level of skill or ability but should confine his or her comments to the situation at hand and the observable actions or behaviors. Evaluation by its nature is judgmental, with goals much different from those of feedback.

Consider a case in which a junior trainee falls into the trap of premature closure. The patient is a 34-year-old woman who presents with pleuritic chest pain. She smokes one pack of cigarettes per day and takes oral contraceptives. The trainee latches onto the diagnosis of chest wall pain and does not entertain the possibility that the patient could have a pulmonary embolism (PE). The skilled teacher would approach feedback in this case in a way that is constructive, nonjudgmental, and conducive to learning while avoiding humiliation and discouragement. Using such an approach, you might state to the learner, "I can see your point. Ms. Smith does have some chest wall tenderness on palpation. Her complaints may very well be that of simple chest wall pain; however, I believe we should consider PE as a possible explanation for her complaint, as this would be a very important diagnosis not to miss." This allows the preceptor to acknowledge the trainee's assessment of the case yet redirect with a

suggestive style that is not offensive, placing emphasis on the clinically important points of the case rather than on the learner's deficiency.

Make feedback a joint venture

Feedback should be a joint venture, in effect, a two-way street. The principle shareholder, the learner, should feel empowered to solicit feedback from the preceptor. However, as we know anecdotally, this is not always the case. A feedback discrepancy has been noted in a study by Gil *et al.* [9], in which the authors identified substantial differences between the amount of feedback the faculty thought they provided and the amount the medical students thought they received. Instructors need to be explicit whenever there is concern that the learner is not receptive or may not be even aware of receiving feedback. At times, advice and mentoring are not considered feedback unless they are so labeled. Sometimes it is necessary to begin a discussion with a student or trainee by stating, "I'd like to provide you with some feedback on your performance." At times, the overly aggressive learner may seek feedback after every case, a situation that may not necessarily be optimal. In such cases, boundaries may need to be set and the instructor may need to state that feedback will be provided at the end of the shift.

Incorporate feedback into your teaching

Feedback should not be provided in isolation. It can be incorporated into various teaching models or methods of teaching. One such model, the One-Minute Clinical Preceptor, consists of five *microskills* that have been shown to constitute an effective approach to teaching: (i) obtain a commitment from the learner, (ii) probe the learner for his or her underlying reasoning, (iii) teach general rules, (iv) provide positive feedback, and (v) correct errors [10]. Feedback should be viewed as one facet of a much broader continuum of medical education.

Imagine a clinical scenario in which you are supervising a trainee who is performing arthrocentesis of the knee. As the learner proceeds through each step of the procedure—obtaining patient consent, equipment preparation, skin preparation, infiltration of local anesthesia—you might ask about the reasoning behind individual actions, offer guidance or suggestions about the specific procedural skill, comment positively on things done well, and correct any errors. By simply interacting with the learner in this informal, natural way, you have used an effective model for delivering feedback. A study involving medical students has shown that trainees receive more instructional feedback if selected procedural skills are observed

directly [11]. To be most effective, feedback should be linked explicitly to direct observation of certain actions or behaviors.

Assist the learner in developing strategies for improvement

Constructive feedback is best followed by an action plan to assist the learner in improving performance. This may be one of the most important aspects of the feedback process. In our role as teachers, we are charged with guiding our learners through the educational process. Thus, it is necessary to provide learners with direction on how they may improve their clinical performance. At times, this aspect of feedback may take a bit of forethought on the part of the instructor. We should be ready to offer resources, ideas, or time to help a learner address any noted deficiencies or areas requiring improvement. This may be as simple as having the learner repeat the procedural skill while incorporating the instructor's suggestions, assigning a book chapter or review article to read, or spending time reviewing cases, electrocardiograms, or radiographs. Incorporating feedback into simulation exercises also provides another opportunity to improve clinical performance in a controlled and safe environment. Real-time suggestions for improving clinical performance can be provided during brief direct observation sessions. Some learners are capable of creating an individualized educational plan, but most, if not all, benefit from the teacher who is available to monitor progress and assist in articulating and implementing the plan. A lack of consistent preceptor continuity can present a challenge to following up and monitoring the learner's progress.

Additional feedback methods and tools

Feedback cards

Several authors have reported on simplified methods for providing effective feedback to learners [12–14]. These reports all revolve around using some type of feedback card to be completed by the preceptor to ensure that feedback occurs and to enhance its quantity and quality. A modified feedback note card was developed at the Medical College of Wisconsin [12]. A feedback note system such as this can easily be incorporated into the daily shift evaluation process that is used by many EM clerkships. However, faculty and resident educational development sessions and buy-in are critical to ensuring the consistency and success of such a program. Buy-in will be necessary from both instructors and learners when implementing any new program.

Written feedback and evaluation

In the ED, constraints stemming from time and patient care may prevent us from being able to consistently reflect on a trainee's performance. Because of this, it is sometimes necessary to follow up on an interaction with a learner with written comments. This may be accomplished by completing an end-of-rotation written evaluation form or in a follow-up email that enables the teacher to provide an extended reflection on the trainee's performance, supplementing the bedside feedback already provided.

Faculty members are frequently called upon to complete daily shift evaluations or end-of-rotation evaluations of learners. A clerkship or rotation grade may be based on a composite of these evaluations. Too often, preceptors do not make full use of this opportunity to deliver feedback. A well-designed end-of-rotation evaluation form should provide the instructor with the opportunity to give constructive feedback to the learner without fear that the comments will affect the rotation grade. Written communication gives us the advantage of being more calculating in our assessment and limiting any potential disconnect between the perceived intent and the likely perception of these comments. Written comments should support previous feedback and not surprise the learner with unfavorable comments that were withheld throughout the rotation to avoid giving negative feedback. If negative comments are provided without previous discussion with the learner, they may have an adverse effect and not serve the purpose of helping shape future positive behavior.

Many of the same guidelines proposed for verbal feedback should be adhered to when providing written feedback. A clerkship evaluation form is an appropriate avenue to praise a job well done and to provide constructive comments so that learners can modify behavior or actions as needed. Comments should be as specific as possible and, to close the loop, should include recommendations for performance improvement.

Formal feedback sessions

A more formal approach to providing feedback can be used in the ED at the conclusion of a clinical shift [15]. Formal feedback should be brief and delivered away from the bedside, in a quiet and controlled area, free of the distractions frequently encountered in the ED. For this type of feedback session to have the greatest impact on the learner, it should be uninterrupted whenever possible. In general, these sessions are more interactive than brief feedback sessions. A formal feedback session should provide an opportunity for the learner to ask questions. The session should be goal oriented, with specific topics on the instructor's agenda. These types of sessions can occur

before the start of a clinical rotation and may be an ideal time to review the learning objectives (competencies) of the rotation and the individual learner's goals for his or her own performance. This type of meeting can set the tone for future feedback sessions.

Trainees who require more extensive feedback in response to documented unprofessional behavior or a trend of less-than-expected clinical performance may benefit from major feedback sessions, which can last 15–30 min or more. Major feedback sessions can be scheduled at the midpoint or end of a clinical rotation and are best held outside the patient care setting, in the instructor's office. Semiannual feedback sessions commonly provided to EM trainees throughout their residency can be used to reinforce a job well done or address major deficiencies or concerns.

Feedback and the accreditation process

The process of providing formal feedback to trainees has been recognized as an integral part of the undergraduate and graduate medical education accreditation processes. The U.S. Department of Education recognizes the Liaison Committee on Medical Education (LCME) for the accreditation of medical education programs leading to medical degrees in USA. For Canadian medical education programs, the LCME works in collaboration with the Committee on Accreditation of Canadian Medical Schools (CACMS). The LCME outlines this expectation in the most recent version (May 2011 update) of the standards for accreditation of medical education programs [16]. The standards mandate that the directors of all courses and clerkships design and implement a system of formative and summative evaluation of student achievement. It is further expected that courses and clerkships provide students with formal feedback during the experience so that they may understand and remediate their deficiencies. In addition, EM residency training programs in USA should provide each resident with formative evaluations of their clinical performance. This expectation is described in the common program requirements (effective July 2007) set forth by the Accreditation Council for Graduate Medical Education (ACGME), the governing body responsible for accrediting the US graduate medical education training programs [17].

Faculty/trainee development

Like any other skill, the technique for providing effective feedback requires training and practice. However well intentioned individual instructors are, feedback is unlikely to occur on a meaningful level in

the ED without a substantial amount of dedication to the education process by the faculty. There is no shortage of materials for training instructors or materials specifically designed for teaching and feedback delivery in the fast-paced environment of the ED [18–20]. Training can be obtained from faculty development programs that include feedback coaching as part of the curriculum (e.g., the Stanford Faculty Development Program) and through departmental or medical-school-supported faculty development courses. Trainees may benefit from a “Resident-As-Teacher” curriculum for EM, which includes a module on giving effective feedback [19].

Conclusion

Feedback is a crucial part of the medical education process and can advance the professional growth of medical students and trainees. Even in the busy and at times chaotic ED environment, instructors can deliver effective feedback using the strategies outlined and can incorporate the provision of feedback into other teachable moments. Individual instructors can choose among a variety of methods of feedback delivery to enhance the learning process and guide the future performance of students and trainees.

Summary points

- 1 Feedback should be descriptive, unbiased, and based on specific observations.
- 2 Feedback should be provided on an objective assessment of the learner’s performance.
- 3 Feedback is intended to stimulate change in the learner’s behavior.

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CHAPTER 8

The computer as a teaching tool

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Computers are a powerful tool for practical teaching in the emergency department (ED). The ability to access remote information means that no ED—from the busiest urban hospital to the quietest rural site—should be an educational backwater. Internet resources can be used to provide “virtual expertise” on the latest breakthroughs and the rarest conditions, allowing students to benefit from the insights of distant teachers. Educators can use Internet resources to illustrate a teaching point, to provide a skill-building exercise for the student, or to enhance their knowledge of a less familiar topic. For teaching programs with multiple and sometimes far-flung clinical sites and variable day–night clinical schedules, computer-based learning can provide a consistent curriculum for students separated in both time and space. Internet-based resources can be tailored easily to the student’s existing level of knowledge, and the sequence of information presented can be individualized, sometimes to a greater extent than in group classroom exercises. In the busiest clinical moments, computer-based teaching can keep the student productively occupied while the physician–educator attends to patient care, with debriefing occurring at a later time. Handheld computing devices extend computer-based learning to the bedside, resuscitation room, and even out-of-hospital setting.

Using online resources to augment education is a pragmatic way of introducing students to skills and content that will likely remain with them for the rest of their careers. In 2010, the Accreditation Council for Continuing Medical Education (ACCME) reported 15,355

enduring Internet continuing medical education (CME) activities, representing 30,104 h of instruction, with 3,763,133 physician participants, making Internet-based content the largest source of accredited CME, accounting for more than one-third of CME activities directly sponsored by the ACCME [1]. In contrast, in 2000, enduring Internet materials constituted only 1082 activities, 4788 h, and 104,145 physician participants, indicating a 36-fold increase in physician participation in a decade [2].

Are computers an effective means of delivering educational content? A number of studies have attempted to measure the educational impact of computer-based learning by comparing it with more traditional live lecture formats. Measures such as examination performance and satisfaction surveys suggest that well-implemented computer learning can match or outperform live classroom exercises, although an important part of many of these programs is some form of interaction with a live educator [3–7]. Spacing online education at intervals of 8–16 days following live educational exercises increases clinical behavior change compared with live exercises alone and is rated favorably by a majority of participants [8].

In this chapter, we introduce a variety of computer-based educational exercises that you can use during your next shift. For each exercise, we suggest one or more Internet sites to get you started, but the constant evolution of web content means the availability of newer and better resources. Mobile device applications offer alternatives to many websites. Search engines such as Google provide a rapid means of locating new tools, but we hope the short, selected lists we have provided will be appreciated (a Google search of “ECG” returns over 30 million hits!). In addition, the student and the teacher alike must scrutinize the source and quality of information obtained from the Internet. Inaccuracies on the Internet result from many factors, including the qualifications of the authors, how recently the information was updated to reflect new research findings, and conflicts of interest in funding sources. A reliable source should name its authors, provide its publication date, disclose its funding source, and list references where applicable. In one study of highly cited research, “positive” study results were contradicted by future research in 16% of cases, and effect sizes were shown to be smaller than originally stated in another 16% [9]. One of the most important educational points to follow is teaching the student to find and use only the most reliable information.

Each of the following exercises can be applied to the student’s real patient. In addition, provoke thought by asking the student about a hypothetical change in the patient scenario, such as pregnancy, an allergy, a new medication, or a comorbid illness. These variations

can transform a seemingly mundane case into a valuable educational experience. For each exercise, a face-to-face discussion and debriefing are important—the computer is a tool to enhance your efficiency and effectiveness, but you remain the teacher. Finally, apply online spaced education—send additional resources to your student via email following the clinical encounter to cement the ideas you have explored.

Improving patient care by locating and implementing evidence-based clinical guidelines

Question: *What is the evidence-based method of diagnosing and treating condition X?*

Students may be unaware that evidence-based consensus guidelines exist for many conditions. Open this discussion by asking the student how he or she would manage the diagnosis or treatment of the patient. Ascertain the student's existing knowledge about the condition. Often, effective teaching is provided by coaxing the student to recognize his or her knowledge deficit or frank misconception and then leading the student to find the best information on that topic (Table 8.1). A great website for this situation is sponsored by the National Guideline Clearinghouse (guidelines.gov). The American College of Emergency Physicians publishes its clinical policies at acep.org/clinicalpolicies (perform a Google search on “ACEP clinical policies”). Medical search engines such as PubMed allow restriction of searches to practice guidelines using a “Limits” feature.

Performing an effective and efficient evidence-based medicine literature search for clinically meaningful answers during a busy shift

Question: *What is the quality of evidence for treatment of condition X with treatment Y or for diagnosis of condition X with modality Y?*

Key to the future success of our students as physicians is their ability to find evidence efficiently and to evaluate it for internal and external validity. This is not just the domain of journal club. In fact, the

Table 8.1 Suggested websites for locating and implementing evidence-based clinical guidelines.

National Guidelines Clearinghouse	guidelines.gov
American College of Emergency Physicians	acep.org/clinicalpolicies
US National Library of Medicine	www.ncbi.nlm.nih.gov/pubmed

importance of evaluating the quality of evidence may be highlighted when an important clinical decision rests on the outcome of the student's analysis. Tell the student that you are relying on him or her to weigh the evidence and commit to a course of action. This transforms the search from a hypothetical activity to one with clinical relevance and involves the student in the patient's care.

Students need to understand how to perform a rapid and appropriately targeted search in the ED and to evaluate the applicability of the research findings to their patients. While practice guidelines can be the source for many diagnostic and therapeutic decisions, they can be outdated or biased by industry sponsorship or they might not exist for the condition in question. Some great exercises include teaching a student to use the "Limits" field of search engines such as PubMed, OVID, and Google Scholar (www.scholar.google.com). Prefiltered specialty databases such as Best Evidence Topics from the *British Medical Journal*, Cochrane database, ACP Journal Club, and Emergency Medical Abstracts compare favorably with broader search engines in identifying clinically useful evidence [10].

Many exercises are possible using medical search engines. Ask the student to structure the clinical question using the Patients/Interventions/Comparisons/Outcomes (PICO) model, demonstrated at the Centre for Evidence-Based Medicine (CEBM) web page (cebm.net) under the heading "EBM tools" → "Asking Focused Questions." Demonstrate to the student that the search term *myocardial infarction aspirin* retrieves 5941 records in PubMed (pubmed.org), while limiting the same search to "human," "English," and "Randomized Controlled Trial" and adding the term *mortality* reduces the number of hits to 398. Adding the search term *emergency* reduces the number of retrieved studies to 17, a reasonable number for the practicing physician to peruse during a clinical shift in the ED. Demonstrate to the student an important corollary: a restricted search strategy can miss important information. For example, the search listed above misses the sentinel ISIS-2 study [11], which demonstrated the mortality benefit of aspirin, because this study was not conducted in an ED. To illustrate this point further, ask the student to perform the same search in multiple engines and compare the results. Another exercise to refine the student's search capability is to pick a target study, such as NEXUS [12] or ISIS-2 [11], and ask the student to answer a related clinical question. An effective search should retrieve the target study, and it may be revealing to the student to experiment with various strategies to see which is most effective in finding clinically relevant evidence. A guide to performing clinically relevant searches was published in the *Annals of Emergency Medicine* in 2003 and demonstrates several useful strategies

that can be reproduced by the student in the ED [10]. In addition, the CEBM website includes excellent tutorials for constructing a search at cebm.net → EBM Tools → Finding the Evidence.

The *Journal of the American Medical Association* (JAMAevidence.com) has published the Users' Guides to the Medical Literature, which is a useful reference for the teacher and the student and is divided into important clinical categories such as diagnosis, therapy, and harm. Consider using these categories to highlight an evidence-based medicine (EBM) point, such as pretest probability or internal and external validity. The same site includes electronic versions of the "Rational Clinical Exam" series (with a table summarizing the likelihood ratios (LRs) for physical examination findings in important disease processes such as abdominal aortic aneurysm) and interactive calculators, including number needed to treat (NNT), number needed to harm, sensitivity, specificity, and LRs. These calculators are particularly useful because they allow the teacher and the student to vary parameters such as pretest probability, population size, or disease prevalence and then observe the effect. This site requires a subscription, although many academic emergency physicians may have free access to it through their institution.

The CEBM also has interactive EBM tools that can be used rapidly to demonstrate an educational point, including critical appraisal worksheets and calculators for common useful values such as NNT. Their interactive LR nomogram helps the student visualize the degree of clinical certainty gleaned from a test result (go to cebm.net/index.aspx?o=1161 or to cebm.net and search for "interactive nomogram" using the site's search bar) (Table 8.2).

Improving use and interpretation of diagnostic imaging

Questions: Does your patient need imaging? Why? What kind? What findings will you look for? What if the images are normal? What is the radiation risk to the patient?

Understanding the role of diagnostic imaging in emergency conditions is a vital skill for the emergency physician and one that can be divided into several important stages:

- 1 risk stratifying patients to determine who needs imaging;
- 2 selecting the diagnostic imaging test appropriate to the condition;
- 3 understanding the radiation risk of diagnostic imaging and revising the imaging plan appropriately depending on patient factors;
- 4 understanding the findings on diagnostic images;
- 5 knowing the limits of diagnostic imaging, thus enabling the physician to recognize when a false-negative result may have been obtained.

Table 8.2 Suggested websites for an efficient evidence-based medicine literature search.

Best Evidence Topics	bestbets.org
Centre for Evidence-Based Medicine	cebm.net
Centre for Health Evidence	www.cche.net
Cochrane Library	cochrane.org
Emergency Medical Abstracts	http://ccmec.org
Google Scholar	scholar.google.com
JAMAevidence	jamaevidence.com
PubMed	pubmed.org

First, ascertain which stages of this process the student can already comfortably perform and then engage him or her with learning more about the stages that are unfamiliar. For example, the student may be aware of the NEXUS [12] rule and may be able to determine whether a patient with blunt trauma requires cervical spine imaging. But the student might be unaware of the limitations and capabilities of imaging tests and might plan to perform cervical CT when plain radiography would be sufficient. In addition, the student might be unfamiliar with the systemic evaluation of cervical spine radiographs or unaware of the limited sensitivity of radiographs for fracture. The student might not know when additional imaging is needed to rule out fracture or ligamentous injury or when a cervical collar and follow-up are indicated.

For each of the stages listed earlier, online resources can assist. Introduce the student to clinical decision rules such as NEXUS; the Canadian rules for cervical spine imaging and head CT; the Ottawa ankle, foot, and knee rules; the Pittsburgh knee rule; and the rules for venous thromboembolic disease risk stratification. Discuss the development of clinical decision rules using derivation and validation phases and then ask the student to identify a clinical decision rule relevant to his or her patient's presentation. A variety of clinical decision rules are available at MDCalc (available at mdcalc.com or perform a Google search on "mdcalc"), some with online calculators. The National Center for Emergency Medicine Informatics (ncemi.org) also provides calculator versions of many of these rules. Teach the student to use and document these rules in the medical record, which is good EBM and good clinical practice for billing and medical decision making. For students who are already quite familiar with clinical decision rules, challenge their thinking by asking about power and precision. These concepts can be illustrated by selecting a clinical decision rule and asking the student to explain the 95% confidence intervals surrounding the point estimate of the rule's sensitivity. Ask

the student “What is the worst-case performance of this rule (lower limit of the 95% confidence interval)? How low might the sensitivity really be? How large would the study population need to be to narrow the confidence intervals to a level acceptable to you to apply this in clinical practice?” Multiple online calculators provide the confidence intervals of a proportion (e.g., <http://faculty.vassar.edu/lowry/prop1.html>). Under the “Calculators” tab at JAMAEvidence.com, a particularly intuitive two-by-two table calculator is available that allows the student to vary the population size, disease prevalence, and false-positive and false-negative rates while observing the effects on sensitivity, specificity, LRs, predictive values, and 95% confidence intervals. Have the student keep the proportions constant while increasing the population 2, 5, 10, or 100 times to observe the effect on confidence intervals.

In many cases, formal clinical decision rules do not exist, but other relevant guidelines can assist in diagnostic decisions. The American College of Radiology (ACR) has published brief evidence-based “Appropriateness Criteria®,” describing the most appropriate diagnostic imaging tests for various clinical scenarios, from right lower quadrant pain to suspected aortic dissection (www.acr.org/ac). Use the site to foster discussion with the student about test selection, sensitivity, specificity, and risks of diagnostic imaging. The ACR Appropriateness Criteria offer a range of variations in clinical presentation, promoting your dialogue with the student about tailoring diagnostic imaging to the particular features of your patient. The clinical policies of the American College of Emergency Physicians also provide evidence-based guidelines on indications for diagnostic imaging in selected clinical scenarios (acep.org/clinicalpolicies), such as suspected pulmonary embolism, blunt abdominal trauma, and suspected appendicitis.

Several websites have useful information demonstrating pathologic images and structured interpretation of imaging tests (Table 8.3). Free searchable archives with annotated radiologic images are offered at mypacs.net. Many useful imaging references, including a series tailored for novices, called *Recognizing . . . a series of short modules designed for beginners*, are available at www.learningradiology.com. Incorporate this information clinically by referring the student to a guide to the abnormality in question, such as “Recognizing a pneumothorax,” and asking the student to review this while the patient is undergoing the imaging test. This provides the basis for your discussion on the patient’s test when it is completed.

Radiation risks of imaging studies are discussed in a brief but accessible publication by the International Commission on Radiological

Table 8.3 Suggested websites for interpretation of diagnostic imaging.

American College of Emergency Physicians	acep.org/clinicalpolicies
American College of Radiology	acr.org/ac
International Commission on Radiological Protection	www.icrp.org/educational_area.asp
LearningRadiology	learningradiology.com
MDCalc	mdcalc.com
MyPACS	mypacs.net
National Center for Emergency Medicine Informatics	ncemi.org

Protection, titled *Radiation and Your Patient: A Guide for Medical Practitioners* (www.icrp.org/docs/Rad_for_GP_for_web.pdf). In addition, this site provides a brief PowerPoint presentation that outlines the risks of radiation during pregnancy (www.icrp.org/page.asp?id=35). Introduce these questions by asking the student, “What will you tell your patient about the risks of the imaging study you are recommending?”

A discussion of pre- and posttest probability and LRs is essential to allow the student to incorporate the diagnostic imaging results, positive or negative, into the clinical plan. Ask the student, “What is the pretest probability of the disease? What is the LR, positive and negative, for the imaging test? What is the posttest probability?” Refer the student to the brief and clear discussion of these topics in the website of the CEBM (perform a Google search on “CEBM likelihood ratio”); the CEBM site also includes an interactive nomogram that allows the student to visualize the interaction of pretest probability and LR. Engage the student to search for the LRs for the imaging study or to calculate LRs from sensitivity and specificity values (described in the CEBM website) (Table 8.2).

Enhancing systematic interpretation of electrocardiograms

Question: Interpret this ECG systematically. What electrocardiographic abnormalities are expected in condition X?

The ability to interpret ECGs is clearly a core skill in emergency medicine. The comprehensive online resources that are available can be a springboard for discussions of ECG abnormalities (Table 8.4). This topic is so broad that the student may be overwhelmed by the amount of material available. First, assess the student’s baseline knowledge by asking him or her to perform a routine analysis of an ECG. Identify

Table 8.4 Suggested websites for interpretation of ECGs.

ECG Library	ecglibrary.com
ECG Primer	anaesthetist.com/icu/organs/heart/ecg
ECG Wave-Maven	ecg.bidmc.harvard.edu
The Alan E. Lindsay ECG Learning Center	library.med.utah.edu/kw/ecg/
Wikipedia "ECG"	en.wikipedia.org/wiki/Electrocardiogram

areas of weakness, for example, an inability to recall the normal QRS duration. Then direct the student to an online resource with a specific question in mind: What is the normal QRS duration? What happens to the QRS complex in a patient with Wolff-Parkinson-White syndrome? The Alan E. Lindsay ECG Learning Center has an outstanding online course in ECG analysis, from beginning to advanced topics, complete with quizzes.

Alternatively, give the student an online ECG to analyze and then compare with the actual patient's ECG. The ECG Wave-Maven site has an excellent tool for this purpose. It allows the teacher to search the library by diagnosis, and the ECG can be displayed to the student with the answer hidden, promoting a Socratic discussion. Ask the student the following questions: What is the most important ECG abnormality? What is the differential diagnosis of the ECG abnormality? What diagnostic tests might be warranted in response to this ECG? What treatments are appropriate? How is this ECG similar to or different from your patient's ECG?

Enhancing understanding of drug toxicity, interactions, and treatment

Questions: Does the patient have toxicidrome? What is the toxin? What is the toxic dose? Is decontamination helpful? Is an antidote available? What are the toxic effects? Are drug levels useful? What drug interactions must be considered? What disposition is appropriate?

Drug effects, interactions, and toxicology are great areas to explore with a student by using computers. These are topics with a wealth of information not easily remembered, and as the practicing physician will often need to rely on online resources, introducing the student to them teaches not only medical knowledge but also practical skills (Table 8.5). Areas for teaching include toxicidromes; pill identification; antidotes and decontamination; toxic effects, including ECG changes associated with ingestions; and recommendations for observation. A fun exercise is to provide the student with an "unknown" pill and ask

Table 8.5 Suggested websites for enhancing understanding of drug toxicity.

Drugs.com	drugs.com
QT-interval prolongation	qtldrugs.org
Drugs in pregnancy	safefetus.com
ToxNet drugs and household products	toxnet.nlm.nih.gov

him or her to identify the potential toxin using an online identification tool. One such tool is [drugs.com/pill_identification](#), an index of pill images searchable by drug name, imprint, shape, and color. Ask the student “If you did not have the pill and could not measure drug levels, how would you predict the type of toxin?” to stimulate a discussion of toxicodromes. Common toxicodromes are reviewed at [uic.edu/com/er/toxikon](#), with a short series of toxicology cases to test the student’s understanding of toxicodromes. The site also poses clinically relevant management questions and answers following brief case presentations. Users can create custom free flash cards and related tests at [quizlet.com](#). Its flash card sets include some toxicodromes.

Up-to-date lists of drugs categorized by their risk of QT-interval prolongation and consequent torsades de pointes are maintained at [qtldrugs.org](#). The National Center for Emergency Medicine Informatics maintains a website ([NCEMI.org](#)) with multiple clinical calculators, including toxicity nomograms for acetaminophen and ibuprofen. Challenge the student to find drugs with toxicity in the patient’s medication list or to identify potentially important drug interactions. If none exists, create one by suggesting an additional therapy and asking the student to determine the safety of the addition. Alternatively, ask the student to suggest a therapy, keeping drug toxicity in mind. For example, the student might be directed to choose an antibiotic therapy in a patient taking Coumadin, phenytoin, or other drugs with cytochrome P450 metabolism. A free application that can be used to identify drug interactions is available at [drugs.com](#).

Drug safety during pregnancy is an important topic that can be explored using a variety of resources. Ask the student “Would this drug be safe to use in a pregnant patient? How will you answer the patient’s questions about risk and benefit?” Up-to-date and Clin-Pharm are subscription services available through many medical centers that provide information on pregnancy and lactation risk. In addition, [safefetus.com](#) provides a list of medications categorized according to pregnancy risk by the US Food and Drug Administration (FDA). Ask the student to find five drugs that are in the FDA Pregnancy Risk Category X. Review the FDA pregnancy risk categories

with the student and pose a scenario involving the potential use of a Category D drug. Ask the student to justify the use of the drug based on potential risk and benefit and to propose a safer alternative therapy.

Toxicity and antidote information is available through Micromedex, a subscription service. In addition, the website <http://toxnet.nlm.nih.gov> lists industrial and household chemicals along with their toxicity and treatment information. Challenge the student to determine the toxicity of the household products under his or her kitchen sink. Propose a case of pediatric ingestion of a household product and ask the student to manage the case. The limits of research in toxicology can also be a useful topic to explore with the student. This is a good opportunity to have the student search for randomized controlled trials of toxicity and treatment, if only to discover the paucity of evidence.

Introducing a systematic approach to describing skin lesions

Question: *How can a skin lesion be described in terms of color, morphology, pattern, organization, and location?*

Skin lesions are a frequent complaint in the ED, and education on this topic is sparse in most training programs. Computer resources can teach the student to characterize a skin lesion systematically to facilitate diagnosis. DermAtlas from the Johns Hopkins University (www.dermatlas.med.jhmi.edu/derm) is a free collaborative archive of dermatologic cases with tools to aid in formulating a differential diagnosis. Provide an image from this database to the student and ask him or her to characterize the lesion by color, morphology, pattern, organization, and body location. With the aid of the online resource, have the student prepare a differential diagnosis for the lesion. As an alternative exercise, describe a dangerous skin lesion, such as palpable purpura, using the systematic approach described earlier. Refer the learner to the online resource to find matching examples of this type of lesion and again ask for the differential diagnosis. Focus the student on life-threatening illnesses with dermatologic manifestations.

Enhancing the neurologic examination, understanding the NIH Stroke Scale, and knowing the indications/contraindications for tissue plasminogen activator for stroke

Questions: *What is the patient's score on the NIH Stroke Scale? Does the patient have contraindications to TPA administration?*

Acute stroke is a time-sensitive severe condition for which teaching in the ED may appear impractical. However, this is an ideal

scenario for hypothetical discussion. Ask the student the following questions: “Does the patient meet the criteria for administration of tissue plasminogen activator (TPA)? What is the patient’s score on the NIH Stroke Scale, and how does this influence your decision? Are contraindications present? What risks would you discuss with the patient and family?” Ask the student to name the components of the NIH Stroke Scale to emphasize the difference between the routine neurologic examination commonly taught to students and the NIH Stroke Scale, which includes extinction and inattention. Have the student download the NIH Stroke Scale (perform a Google search on “NIH Stroke Scale”; also available through www.mdcalc.com/) and apply the scale to a patient who has no clinical concern for acute ischemic stroke, such as a patient with mild blunt traumatic head injury, thus eliminating the concern about time dependence. Time the student’s administration of the NIH Stroke Scale to emphasize the importance of initiating assessment rapidly, given the short treatment window for ischemic stroke. Ask the student to record the time required to transport the patient to and from the CT suite, perform the scan, and receive the CT interpretation from a radiologist. Role-play the risk–benefit discussion with the student. The Foundation for Education and Research in Neurological Emergencies (www.ferne.org) has posted the NIH Stroke Scale, the indications and contraindications for TPA, and a discussion of risks on its website, under the heading “Clinical Practice → National Institutes of Health Stroke Scale.”

Enhancing the student’s use of scoring systems, calculators, and decision rules to provide the basis for and documentation of care

Question: *How do we make a structured risk assessment for condition X?*

Clinical decision rules and scoring systems are growing in importance in emergency medicine and are an important topic for education. The strengths and weaknesses of these scores can be highlighted to the student using online resources. In addition, the student can learn to incorporate these scores into the medical record as a form of documentation of medical decision making (for billing, medicolegal, and medical communication purposes). MDCalc provides an array of online scores and calculators commonly used in emergency medicine practice. These include the PORT score, the Wells criteria, Pulmonary Embolism Rule Out Criteria (PERC), and the Glasgow Coma Scale. As an example of the use of these calculators, ask the student about his or her planned disposition of a patient with pneumonia and then demonstrate the PORT score for that patient. Explain to the

student the limits of the PORT score, and role-play a discussion with a consultant using the score to bolster a decision for admission or discharge. Ask the student to write a note for the medical record explaining the patient's PORT score and the disposition decision. Challenge the student to name factors not included in the PORT score that should influence disposition decisions. Similarly, ask the student to list classic pulmonary embolism risk factors (such as factor V Leiden deficiency, strong family history of thromboembolism, or extensive travel) not explicitly described in the Wells criteria or PERC, emphasizing the importance of acquiring a thorough history. Ask the student how these risk factors are incorporated into the Wells criteria, if not overtly. The student should voice understanding that these factors are incorporated at the level of the physician's assessment of overall pulmonary embolism risk and that thus the Wells criteria or PERC cannot be used robotically without appropriate history and gestalt risk assessment.

Preventing medical error

Question: How do we calculate a drug dose? What is the patient's body mass index? What is the patient's creatinine clearance?

Online calculators can ease the sometimes difficult task of determining a patient's medication dose or calculating unfamiliar physiologic values. MDCalc includes a glomerular filtration rate calculator that is useful when dosing patients with renal impairment. In addition, Google (www.google.com) acts as a calculator that performs automatic unit conversion and conveniently displays the conversion to allow the user to double-check the result. As an example, type “30 lb * 50 mg/kg =” and Google replies “(30 pound) * 50 (mg/kg) = 680.388555 milligrams.” Type “38.1C to F” and Google produces “38.1 degrees Celsius = 100.58 degrees Fahrenheit.” Students and teachers alike should beware overreliance on “black-box” calculators without appropriate understanding of the underlying formula and likely range of plausible results. Without this understanding, the physician is unlikely to recognize erroneous results, whether they are from user error in entering values into the calculator or from incorrectly programmed calculators. As an example, test the student's recognition of an intentional 10-fold drug-dosing error. Emphasize the need to look up uncommon formulas and drug doses to confirm calculations by repeated entry into the calculator as well as to confirm doses by double-checking using more than one online calculator (e.g., www.mdcalc.com).

Improving the student's understanding of normal changes in pregnancy, pregnancy complications, radiation risks in pregnancy, and contraindications to medications in pregnancy

Questions: What are some expected laboratory and vital sign changes in pregnancy? How do hCG values change in pregnancy? What classes of drugs are safe in pregnancy? What is the risk of imaging in pregnancy?

The pregnant patient in the ED presents a common scenario for education on drug and radiation risks, complications of pregnancy, and normal physiologic changes. We discussed earlier some online resources for drug and radiation information. Another common theme is the correlation between the level of human chorionic gonadotropin (hCG) and normal fetal development. Explore with the student the range of expected hCG values in a patient on the basis of the date of her last menstrual period. Ask the student to predict the hCG value in 48 h, assuming the pregnancy is normal. Have the student consider the expected ultrasound findings at a given hCG level (assuming a normal pregnancy) and explain the concept of the discriminatory zone. Change the scenario to a possible ectopic pregnancy and ask the student to reflect on the possible hCG values. eMedicine provides clear explanations of these topics as well as many other emergency medicine subjects. Perinatology (perinatology.com) provides links to a variety of specialty topics and calculators relevant to the pregnant women and fetus. The Centers for Disease Control and Prevention (CDC) provides clear explanations of radiation risks in pregnancy (<http://www.bt.cdc.gov/radiation/prenatal.asp>), which are appropriate for sharing with patients. Many students and teachers may be surprised by the information on these fact sheets—a learning experience in itself. Ask the student to role-play a discussion with a pregnant woman regarding radiation risks. Have the student then review the CDC fact sheet to identify disparities. Point out how misinformation provided to patients can lead to harm, such as unnecessary avoidance of important medical tests with minimal risk, and can undermine the patient's trust in the physician if the patient recognizes inconsistencies in the information provided (Table 8.6).

Table 8.6 Suggested websites on the pregnant patient.

CDC	www.bt.cdc.gov/radiation/prenatal.asp
Perinatology	perinatology.com/exposures/Physical/Xray.htm
eMedicine	emedicine.com

Reinforcing the importance of clear communication and use of fluent translators for non-English-speaking patients

Question: Does your patient speak fluent English? Do you speak your patient's primary language fluently? Could your patient have misunderstood your questions or instructions?

Non-English speakers are an important segment of the ED patient population, and miscommunication can impair diagnosis as well as compliance with the treatment plan and follow-up. Interpreters are underused [13] in the ED, and students with moderate language ability may be tempted to rely on their interpretation or that of a family member, rather than engaging a professional interpreter. To emphasize the need for interpreter services, ask the student to write discharge instructions using a web-based translation program, such as www.translate.google.com (Figure 8.1) or Yahoo's Babel Fish (www.babelfish.yahoo.com). Have the student translate the instructions from English to the target language and then back to English. If the resulting English instructions differ substantially from the original instructions, it is likely that the translation was confusing or imprecise. Ask an on-site interpreter to review the instructions with the student for mistranslations. This may reinforce the possibility that the student may have misconstrued the patient's meaning of a word during the interview or that the discharge instructions could be erroneous. Although computer translation programs are improving, errors in translation remain a threat.

Understanding uncertainty in medicine

Questions: How certain are we that treatment X improves outcomes for condition Y? How large is the treatment effect? Is there a chance that the treatment actually causes harm? Have all the important outcomes been considered? (Similar questions can be asked of diagnostic tests.)



Figure 8.1 Translation of medical information to be conveyed to a patient.
©2011 Google.

A key skill required of physicians is understanding uncertainty in medicine. Textbooks often ignore measures of uncertainty, and students may not be familiar with the uncertainty that can come from otherwise well-designed but underpowered studies or, more fundamentally, from study designs that cannot definitively answer our clinical questions. Begin your discussion by asking the student to look up the sensitivity of a test or the reduction in mortality from a particular treatment in a standard reference. Take the example of septic shock. At the time of the writing of the chapter, eMedicine (<http://emedicine.medscape.com>) reported the following about septic shock: "... the investigators found an absolute mortality benefit of 16% with EGDT [early goal-directed therapy] (30% mortality with EGDT vs 46% with standard therapy)" [14]. Ask the student how certain this benefit is and the range of possible benefit. What is the maximum benefit? What is the minimum benefit? Ask the student what measures are used to describe this and where this information might be found. If needed, direct the student to the original research publication or other sources cited by the standard reference. In the case of EGDT (early goal-directed therapy), review with the student the original study data that demonstrates a relative risk of in-hospital mortality of 0.58 with EGDT compared with standard therapy, with a 95% CI ranging from 0.38 to 0.87 [15]. Help the student understand the concept of confidence intervals as a measure of the range of likely "true" values. Assist the student in exploring this concept further by using a risk-reduction calculator such as that at JAMAevidence (<http://jamaevidence.com/calculators/9000025>). Have the student input the actual values from a published study and then try different values to see how sample size affects the study results.

As a variation on this theme, ask the student to consider the potential benefit and harm of a therapy. Direct him or her to a study related to the question at hand, and ask the student to determine how many serious adverse outcomes were reported. Were all important outcomes assessed? Consider the example of heparin therapy for myocardial infarction. Websites such as the NNT (www.thennt.com) provide brief summaries of the evidence for benefit and harm, which are extracted from other summary documents such as the Cochrane database. NNT reports "100% [of patients treated with heparin for acute coronary syndromes] saw no benefit," while 4% were harmed by a major bleeding event. If true, this would imply that heparin therapy should be avoided. Ask the student to review the original Cochrane document to determine the accuracy of the statement. Expand the student's understanding by asking, "Did the researchers report functional outcomes or surrogates of this such as left ventricular ejection fraction?" Demonstrate that important potential benefits

may have gone unmeasured by studies. Help the student understand that small studies may also fail to uncover important risks from medical interventions. Perform a Google search on the question “When nothing goes wrong, is everything alright?” and use one of the resulting references to explore the question of harm. Publications such as the article by Hanley and Lippman-Hand [16] provide easy methods to estimate the likelihood of rare but serious outcomes.

Bring to the student’s attention the risk of outdated references or relying on a single study to change clinical practice. A recent high-profile example demonstrates the importance of this concept: in a randomized controlled trial, the use of activated protein C therapy for severe sepsis appeared to improve survival and was subsequently strongly advocated in the Surviving Sepsis Campaign, funded by the drug manufacturer Eli Lilly [17, 18]. Further study overturned this benefit while confirming substantial risks of therapy, resulting in the withdrawal of the drug from the worldwide market [19].

Using online video in emergency medicine

Question: What preparations are necessary before procedure X? What are the steps of the procedure? What risks and complications should be anticipated?

The proliferation of video content on the Internet provides a wealth of opportunities for learning and teaching in the ED, provided video sources are selected carefully. Ask the student to review a video in preparation for a planned procedure, with the goal of deeper understanding and better performance of the procedure. For emergency procedures such as intubation or emergency thoracostomy tube placement, use video as a means of debriefing after the procedure if the urgency of the procedure did not allow sufficient explanation at the time. The *New England Journal of Medicine* has outstanding procedure videos on its website. YouTube ([youtube.com](https://www.youtube.com)) provides readily accessible, although potentially less reliable, sources of information.

Online spaced education

Your educational encounter with the student in the ED should not end there. Studies show that additional related online education at an interval of 8–16 days can improve clinical behavioral change [8]. Make a point of emailing your student after your shift to provide additional resources, creating a dialog that improves the effectiveness of your teaching efforts.

Summary

Online computer resources provide outstanding tools to facilitate education in the ED. They allow sharing of medical knowledge, exploration of concepts in clinical thinking such as pretest probability, and interpretation of clinical data such as ECGs and imaging studies. The role of the educator remains paramount, and framing the relevant question and debriefing the student are vital to ensure that the student learns and retains the information and skills essential to emergency medical care.

Summary points

- 1 Computers are an effective tool for teaching content and clinically useful skills (Table 8.7).
- 2 The role of the educator remains paramount; debriefing is essential.

Table 8.7 Top 10 recommended websites to use during a shift.

Topics	Web address ^a
Guidelines in emergency medicine	guidelines.gov
Evidence-based medicine literature searches	cebm.net
Medical images	learningradiology.com/
ECG interpretation	library.med.utah.edu/kw/ecg
Drugs and toxicology	drugs.com
Dermatology	dermatlas.med.jhmi.edu
Neurology	ferne.org
Clinical decision rules and scores	mdcalc.com
Pregnancy	perinatology.com
Translation	translate.google.com

^aThese are the shortest web addresses for the web browsers Internet Explorer and Firefox. The user might be redirected to a different address.

- 3 Computer-based exercises can assist students to
 - a improve patient care by locating and implementing evidence-based clinical guidelines;
 - b perform an effective and efficient EBM literature search for clinically meaningful answers;
 - c improve utilization and interpretation of diagnostic imaging;
 - d practice systematic ECG interpretation;
 - e understand drug toxicity, interactions, and treatment;
 - f describe skin lesions systematically;

- g perform a thorough neurological examination;
- h apply the NIH Stroke Scale;
- i recognize indications/contraindications for TPA for stroke;
- j utilize scoring systems, calculators, and clinical decision rules to provide the basis and documentation for care;
- k understand normal changes in pregnancy, pregnancy complications, radiation risks in pregnancy, and contraindications to medications in pregnancy;
- l reinforce clear communication and use of fluent translators for non-English-speaking patients.

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CHAPTER 9

Educational technology: Web 2.0

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Introduction

Take a look around the next time you are walking through the lobby of your school or workplace. You will likely see people texting on their phones, typing at their laptop, surfing with their tablet, listening to their MP3 player, or coordinating a combination of these tasks. Is there any doubt that we live in a digital world? The past 15 years have seen the Internet become a powerful tool for networking, disseminating information and news, and teaching. When the Internet was conceived, it was hoped to be a “collaborative medium, a place where we [could] all meet and read and write” [1]. The original version of the Internet, known as *Web 1.0*, was inherently complex and required the skills of experts to post content. After content was written and placed online, end users could read it but they could not interact with what they saw. Around the turn of the century, new publishing tools allowed anyone with access to a computer to create, edit, and read content. These tools are collectively known as *Web 2.0*. *Web 2.0* is not a new technology but rather a new approach to how users interact and share information on the Internet. *Web 2.0* applications allow users to gather, combine (i.e., mashup), and collaborate on large amounts of information using images, text, video, and audio recordings. *Web 2.0* makes it very easy for anybody to start a podcast, a blog (i.e., a Weblog), or forum where people can go to read, listen,

watch, or learn about topics they find interesting. Web 1.0 consisted mainly of static web pages that were rarely changed; Web 2.0 consists of dynamic content that changes often and responds to those who are viewing the information. Web 1.0 is to Web 2.0 as a billboard is to interactive television. Now anyone can control what they see, when they see it, and how they see it.

Educators should be well versed in the use of these tools. The potential uses of these tools are discussed in the following.

- *Communication.* Journals dedicated to education exist, but novel curricular innovations that may not meet the criteria for standard publication are emerging across the country. Using Web 2.0 tools, we can share our experiences and gather feedback from our peers, perfecting our work and disseminating useful tools to push education forward without the typical time lag that plagues publications. Communication is not limited to prose, which often proves to be a difficult way to teach complex or visual tasks. Audio recordings, videos, photos, and large documents (which are difficult or prohibitively expensive to publish in print media) can be published on Web 2.0. Learners can use these tools in a similar way. They can post their thoughts, experiences, and reflections onto a blog and receive feedback from peers or teachers. Knowing that an audience is reading their work may stimulate the learner to try harder to perfect what he or she is trying to communicate [2].
- *Collaboration.* Online tools allow educators and students to work on a single document or project at the same time from remote locations. You can now collaborate on a publication with colleagues in other countries and immediately see their additions, deletions, and edits while speaking to them over a videoconference call that appears as a small window on your computer screen. The delays inherent in standard delivery services (e.g., postal service, FedEx) can now be avoided during the collaborative process.
- *Dissemination of information.* The Internet and Web 2.0 make it extremely easy to share and disseminate your latest project, lecture, or publication with minimal expense and incredible speed. A video of a lecture or a podcast can be shared with millions of viewers simultaneously on the Internet, at no cost to the lecturer. These days, a great lecture does not have to be limited to a single institution—it can be shared with the world!

This chapter provides information on how Web 2.0 applications and technology can be used to facilitate learning. Today's learners tend to be easily distracted and are quick to experience boredom. Web 2.0 can help hold their interest, reinforce important principles by incorporating test questions into a presentation, and augment a presentation with video or sound recordings. Whole books have been

written on many of the topics that we discuss, so consider this chapter as a primer to encourage you to read more about the technologies that are available.

“Really Simple Syndication” or “Rich Site Summary”

Web 1.0 websites forced the reader to return often to check for updates. In many cases, there were no updates, so the reader’s time was wasted. RSS (Really Simple Syndication or Rich Site Summary) saves time by “pushing” updates automatically to interested readers via “feeds.” RSS has become widespread on many websites, particularly news, journal (Table 9.1), wiki, and blog sites. With RSS, users can stay up to date with new content from more sources in less time [1, 3].

Feeds are short summaries of new information, similar to headlines in a newspaper. The feeds are aggregated and read through a reader or feed aggregator. Feeds can be set to restrict searches based on keywords and time. This helps readers avoid “information overload” and allows them to control the amount and type of content that is pushed to them. On the basis of the information in the feeds, readers who are interested in the full story can click on the headline and the remainder of the article will be displayed. Many Internet browsers now incorporate an aggregator. Many freestanding programs and mobile applications are available for free and make RSS reading easy (Table 9.2).

From the perspective of an educator creating content, RSS allows students to instantly receive updates on the availability of new information, such as schedules, photos, videos, and blog posts.

Table 9.1 Emergency medicine journals offering RSS feeds.

<i>Academic Emergency Medicine</i>
<i>African Journal of Emergency Medicine</i>
<i>American Journal of Emergency Medicine</i>
<i>Annals of Emergency Medicine</i>
<i>Emergency Medicine Australasia</i>
<i>Emergency Medicine Journal</i>
<i>International Journal of Emergency Medicine</i>
<i>Journal of Emergency Medicine</i>
<i>Western Journal of Emergency Medicine</i>

Table 9.2 RSS aggregators.

PC and Mac Applications	
Aggregator	Website
BottomFeeder	www.cincomsmalltalk.com/BottomFeeder
Google Reader	www.google.com/reader
RSS Bandit	rssbandit.org/
SeaMonkey Mail and Newsgroups	www.seamonkey-project.org/
Songbird	getsongbird.com/
Tiny Tiny RSS	tt-rss.org/redmine/
iPhone, iPad, and iPod applications (available through iTunes)	
MobileRSS Free	xFeed RSS Reader
Free RSS Reader	iNews
RSS	RSS Runner
Android applications (available at market.android.com)	
NetaShare	NewsRob Free
GoNews	Pulse News
gReader	Google Reader

Wikis

A wiki (derived from the Hawaiian word *wiki wiki*, meaning *fast*) is a website that allows content to be edited, created, or removed by multiple users [3]. The best known commercial version of a wiki is “Wikipedia,” which has become a de facto encyclopedia of information [4]. Because anyone can contribute, edit, or remove information, wikis are well suited to collaborative learning. Some uses of a wiki are listed in Table 9.3.

Adult learners bring their own interests and experiences into the learning encounter [5]. Wikis take advantage of this concept by allowing the learner to contribute to the “knowledge” available on the website. Wikis allow multiple contributors to maintain the quality of information. This is similar to the peer-review process for manuscripts, except that there are far more reviewers than would be involved in a normal peer review. Critics have cast doubt on the ability of an open website to maintain quality; however, several studies have compared Wikipedia with the online Encyclopedia Britannica (Web 1.0 based) and found equal accuracy in their content [3].

Wikis can be customized by the site administrator. Wikis can be made private, allowing only invited individuals to contribute, or they can be open to the public. Varying levels of access can be set to limit

Table 9.3 Uses of a wiki.

FAQ	Create a list of FAQs on how to do procedures, admit patients, contact consultants, or prepare for the next rotation
Curriculum	Create an online curriculum with articles on the rotations and links to required readings; contact information for the leaders of the rotation can also be included
Employee roster	Create an online biography of your departmental staff, including photos, research interests, personal interests, and contact information (access restricted)
Project management	Assign tasks, post a timeline, and add notes; employees can update the wiki as the project progresses
Procedure/Policy manual	Store all the procedures and policies of your institution

FAQs, frequently asked questions.

users' ability to read, edit, delete, or start new articles. Individual pages or articles can be linked to an RSS feed. This informs authors of changes made to their page. In theory, this helps with the peer-review process and to catch and correct inaccurate statements rapidly.

Wikis are the most involved of the social media tools, but they are easy to use even by people with limited experience. The first step in starting a wiki is to find a site to host it. Many sites are available for little to no cost (Table 9.4). Next, determine the level of openness: public access (anyone can read or edit), read only (nobody is allowed to contribute, edit, or delete other than the administrator), or private (readers must be invited). For a minimal fee, most host services allow the creator/administrator to create a dedicated domain name (e.g., www.yourname.com).

Once the wiki is created, the author(s) can begin to create and edit pages. Wiki hosts have online tools to assist with this process. In the most basic form, the host provides an online "word processor" into which the author can type the content. The interfaces are designed to make it easy to create and link pages, change the layout (using one or multiple columns), change the background color or image, and import rich content such as music, images, video, and documents.

Table 9.4 Wiki sites.

sites.google.com
pbworks.com
wikidot.com

Blogs

Blog is a portmanteau of the words *web* and *log*. Blogs are simple websites designed and edited by an author or group of authors. Blog-hosting services generally offer web-based software that the author uses to compose the pages or “posts.” Some sites allow posting just by sending an email. For this reason, blogs are easy to update and the publication of posts is nearly instantaneous. Many blogs feature the ability to add tools, called *widgets*. Widgets allow the author to link to other blogs and websites, index posts, post the latest weather or news story, and a perform host of other options. Most blogs give readers the option of leaving comments. In an educational setting, the comments can serve as feedback to the author or they can be used to generate a discussion among class members.

There are no limits to what can be posted on a blog, but most blogs tend to follow a set theme (e.g., emergency medicine, orthopedics, critical care). Blogs can consist of text, pictures, audio, videos, podcasts, and embedded documents.

Blogs have become quite popular with emergency physicians. Life in the Fast Lane, one of the original blogs with an emergency medicine theme, now hosts a growing directory of emergency medicine blogs as well as a weekly summary of their posts. Some recommended emergency medicine blogs are listed in Table 9.5.

The following lists examples of the uses of a blog for educational purposes.

- A clerkship director can create a blog that outlines expectations for incoming students, gives examples of poor and well-done presentations, provides maps of the department and the hospital, and posts schedules.
- A teacher can have students blog for the purpose of gauging their knowledge or reflecting their abilities [6]. This may prove to be a beneficial method of remediation for learners.
- A residency director could use a blog to generate discussions about medicolegal, ethical, or difficult cases. The same blog could be used to notify residents about upcoming conferences, indicate changes to the curriculum, and announce social events.

Before beginning to blog, it is helpful to decide the purpose of the blog and how the technology will enhance learning. A blog with a specific theme is more likely to generate a following than if it is random thoughts or diatribes. A blog can be set up in minutes using one of the hosted sites listed in Table 9.6. A post can be created by using the site’s online word-processing tools and by sending an email to a specific address that is provided during the setup process; mobile applications can be used to post more frequently (“mobile blogging”) [4].

Table 9.5 Recommended emergency medicine education blogs.

Blog name	Website
Academic Life in Emergency Medicine	academiclifeinem.blogspot.com
Better in Emergency Medicine	betterinem.blogspot.com
EM Critical Care	www.emcrit.org
ER Cast	www.ercast.org
Smart EM	www.smartem.org
The Poison Review	www.thepoisonreview.com
Life in the Fast Lane	www.lifeinthefastlane.com
iTeachEM	www.iTeachEM.net

Table 9.6 Blog-hosting sites.

www.blogger.com
www.wordpress.com
www.blogdrive.com
www.livejournal.com

Most sites permit the uploading of videos, audio, and photos. Once a post is uploaded, it will appear as its own page, with an option for viewers to leave comments at the bottom of the page.

Microblogging

Microblogging is a social media tool that is a combination of blogging and text messaging. Several services can be classified as microblogs; the leader by far is Twitter. Twitter was launched in 2006 and quickly became popular. By June 2009, the service had reached more than 30 million users [7]. Twitter was founded as “a real time information network that connects you to the latest information about what you find interesting” [8].

Twitter is the most simple of the Web 2.0 tools to use. The service limits individual posts to 140 characters, which forces brevity. Twitter allows the user to reach out to large groups and disseminate information rapidly. Some teachers have found that microblogging technology gives students a “voice.” The online format tends to remove student inhibitions. A student who may not have spoken up in an open forum will post questions to a teacher. This allows the teacher to address learning deficiencies and adjust teaching to learners’

needs [9]. Teachers can receive “tweets” or posts during their lecture and respond to them. This is ideal if they are simulcasting their lecture to distant learners who do not have the ability to raise their hands.

Microblogging is easy to learn and use. After an account is created, you can begin posting immediately. Tweets can be simple text or can link the reader to web pages, articles, images, or video [3]. You can “follow” other members, which means you will be updated whenever they post something new. Followers can receive updates through the twitter.com website, SMS (text message), email, and several twitter applications.

Twitter can be used in many ways. The use of a URL shortener (Table 9.7) allows a user to post links to websites while adding some descriptive text. Twitter has been used in emergency medicine to keep followers aware of updates with disaster preparedness, politics, and news [7]. Within education, Twitter has been used to ask board-style questions, share links to online learning resources, and, similar to RSS, post updates about changes to websites. Twitter has also served as a method to share information being presented at meetings. At a recent meeting of the Society for Academic Emergency Medicine (SAEM), attendees posted several hundred tweets to keep interested followers up to date with event happenings, presentation information, and reviews of featured speakers.

Podcasts

Many students prefer to learn by listening and can often find time while driving or exercising to listen to an educational program. Like “blog,” “podcast” is a portmanteau of Apple’s “iPod” digital media device and “broadcast” [3]. Podcasts are digital recordings that can be downloaded or streamed off the Internet and played on computers, portable music players (e.g., iPods), and smartphones. Most commonly, they are audio recordings but can also contain video (i.e., VodCast).

In today’s busy society, podcasts allow the learner to transport educational material anywhere [4]. Subscription services, such as iTunes, allow learners to follow the publication of new material without

Table 9.7 URL shorteners.

- www.bitly.com
- www.tinyurl.com
- www.snipurl.com

relying on memory to check for new programs [3]. Current uses of podcasts include recorded lectures, prepared audio or video lessons, recording of book chapters, and libraries of physical examination auscultation findings [4].

Podcasting depends on a “publish and subscribe” model in that

- 1 the author creates and edits a podcast;
- 2 the podcast is uploaded to or “published” by a host server;
- 3 the end user requests a subscription;
- 4 the server delivers the podcast;
- 5 the end user listens on a computer or synchronizes the file with a portable device.

The creation of an audio podcast requires a computer, a microphone, and recording software. Video podcasts also require a video camera. Numerous software programs (e.g., Audacity, WavePad Sound Editor, GarageBand) can be used to record a podcast, and most new computers come with one of them. Once you have the necessary equipment, you need time to record and edit your recording. It is generally estimated that you will spend two to four times more time on editing your recording than it took to record it. Editing is necessary to remove extraneous pauses and mistakes. A full discussion of these needs is outside the scope of this chapter but can be found in the comprehensive text by Mack and Ratcliffe [10].

Most content creators choose a theme and post in regular predictable intervals. Many podcast authors upload material to iTunes for dissemination, but other services are also available (Table 9.8). You can even post the audio file on your blog for people to download and no service is required. Examples of emergency medicine podcasts are listed in Table 9.9.

Social networking

Social networking is based on applications that build on the ideologic and technologic foundations of Web 2.0 and allow the creation and exchange of user-generated content [11]. Social networking sites

Table 9.8 Podcast hosting services.

Service	Website
iTunes	wwwitunes.com
PodBeans.com	www.podbeans.com
MyPodcast.com	www.mypodcast.com
Liberated Syndication	www.libsyn.com

Table 9.9 Recommended emergency medicine podcasts.

Podcast name	Website
Critical Care Perspectives in Emergency Medicine	www.ccpe.com
EMCast	www.emedhome.com/cme_emcast.cfm
EMCrit	www.emcrit.org
EMRAP-EE (Educators' Edition)	www.emrapee.com
EM:RAP	www.emrap.net
ERCast	www.ercast.org

tend to focus on some or all seven of these functional building blocks: identity, conversations, sharing, presence, relationships, reputation, and groups [12]. The best known examples of social networking are Facebook, MySpace, and Google+. There are many more of such examples, and at present, niche sites are being created that are tailored to certain professional groups. For instance, Doximity is a recent addition in which only physicians can join.

Social networking is really meant to encompass any website that allows multiple users to post and comment. Therefore, Internet forums, blogs, wikis, and microblogging sites all fit under the umbrella of social networking.

Social networking sites are designed to make it easy to share information. Most blogs, news sites, and educational websites now display a “Share,” “Like,” or “Recommended” button (Figure 9.1) on every article they post. By clicking on one of these buttons, a message is instantaneously posted on your profile on Facebook, Twitter, or other sites, which alerts anyone who is following you that you found the post or article interesting. Friends and colleagues can then read the same article and post their comments on it. The discussion that ensues is where the “social” comes into this media.

Social networking is being used increasingly by companies and organizations to enhance their reputation, develop a consumer base,

Symbol	Meaning
	RSS feed
	Google + share button
	Facebook like button
	Twitter share button

Figure 9.1 Symbols.

promote products or sales, and provide discounts to people who “follow” them. These benefits can also be realized by educators, residency programs, and departments trying to increase their national and international reputation. These sites can facilitate contact with alumni and can be used to make announcements about promotions, recent publications, awards, and other honors. The magic in these sites is that they allow crossposting of information. This means that someone can see a post and then repost it on their profile, thus increasing the number of people who see the initial post that was sent out. Their audience becomes your audience.

To get started with one of the social networking sites, you need to create an account and send requests to people you know to “friend” you on the site. Most sites facilitate this process by sending an email to everybody in your address book. Once you have some friends, the sites will begin to display their posts on a news feed. You can then comment on their posts or post your own.

Websites have been set up to help beginners with Twitter, Facebook, MySpace, and Google+. A simple web search will find these guides and get you up and running quickly.

Learning management systems

A learning management system (LMS) is a comprehensive software application that enables you to run a course online. Some of the more common LMSs are listed in Table 9.10. An LMS can be used for training programs, e-learning courses, continuing medical education (CME) courses, or an entire curriculum. A robust LMS should be able to [13]

- centralize and automate administration;
- use self-service and self-guided services;
- assemble and deliver learning content rapidly;
- consolidate training initiatives on a scalable web-based platform;
- support portability and standards;
- personalize content and allow knowledge reuse.

An LMS should allow an administrator to control enrollment, compute grades, administer and grade tests, assign tasks, display presentations or videos and should allow students to provide feedback and complete evaluations. The system should be able to handle 10, 1000, or 1 million students, and the information should be used easily over and over again. The benefits of an LMS are summarized in the following [14].

- *Increased teaching efficiency.* Increased efficiencies in course design and delivery once the initial setup is complete.
- *Enriched student learning.* Improved student resources; students can access the system where and when it is convenient to them.

- *Meeting learner expectations.* Students expect to be able to access their classwork through their computers.
- *Agent of change.* Use of an LMS can announce and incorporate changes in the infrastructure and physical plant of a program or school.
- *Improved regulation and standardization of teaching.* Templates ensure order and consistency between courses and modules.

Although the initial setup can take some time, and lectures and tests need to be created, once the initial setup is completed, minimal effort is required to enroll students and present the course. The setup can be used for multiple classes at the same time or over many terms. An LMS allows the learner to watch content, complete assignments, and take exams when it is convenient to them, not at predefined times. Examinations can be graded automatically, and the learner can receive immediate feedback on why an answer is incorrect. Help is available via online discussions or a simple email to the instructor.

A description of how to use an LMS is beyond the scope of this chapter and is largely dependent on the system that is being used. Most universities and colleges have an LMS and conduct classes to educate instructors on how to use it. Online help and Internet forums are also available for most of the programs listed in Table 9.10.

Web-based applications

Web-based applications, or “apps,” are software products (e.g., word processors, presentation software, photo editors, spreadsheets) that can be accessed by any computer connected to the Internet. In the past, a computer user had to purchase a software product that gave them a license to use it on a limited number of computers. If they typed a document on that computer, they could not edit it anywhere else

Table 9.10 Learning management systems.

Product	Website
Blackboard	www.blackboard.com
Certpoint	www.certpointsystems.com
Cornerstone OnDemand	www.cornerstoneondemand.com
Learn.com	www.learn.com
Moodle (Open Source)	www.moodle.org
Oracle iLearning/PeopleSoft	ilearning.oracle.com
Rcampus	www.rcampus.com
Saba Software/Thing	www.saba.com
SharePointLMS	www.sharepointlms.com

unless they carried it on a storage device. Web-based apps changed all that.

Web-based apps offer advantages over locally hosted programs. These tools mirror familiar programs, except that they are usually free and hosted in the “cloud.” The “cloud” refers to Internet-based hosting or saving of information. Cloud-based programs allow users to store data securely online, essentially backing up data against loss. The information is available on any computer with an Internet connection and is platform independent. Platform independence ensures that you will be able to access the information whether you are using a PC, Mac, smartphone, or Linux computer.

Some applications go a step further, fusing a desktop program with cloud-based storage (e.g., Dropbox). These programs automatically synchronize data between computers and mobile platforms, allowing access to your data anywhere, anytime. Most programs also allow the material to be saved onto a local computer or device in addition to the cloud.

These tools also offer the ability to collaboratively edit documents. Owners can invite other authors to add to a document in real time. This eliminates the need to email or mail a document back and forth a multitude of times in order to complete a project. Calendars can be shared between users or groups. Users can also send links to the information instead of sending the entire document, eliminating the need to worry about data size restrictions.

Some of the available tools are listed in Table 9.11. Recent novel examples of incorporation of these tools into teaching include the creating a collaborative concept map [15], obtaining real-time lecture feedback [9, 16], and providing live updates to a blog during a presentation [17]. The use of these tools is limited only by an educator’s creativity.

Social media risks

Despite the many benefits of social media in education, several issues have emerged that are worth exploring. Recent studies and several news articles have identified problems with physician professionalism and violations in patient privacy. In addition, ownership of content is a much discussed topic. In this “publish or perish” world, maintaining ownership of academic material has become paramount. In this section, we delve into these issues.

Professionalism

Professional behavior among physicians and medical students has become a major area of focus in academic centers. The ease of

Table 9.11 Examples of web-based apps.

Program	Description	Web site
Google Documents	Includes programs for word processing, spreadsheets, presentations, drawing, and creating forms	docs.google.com
Evernote	Allows notes to be synced between multiple platforms; notes can include pictures, PDF files, and text	www.evernote.com
Dropbox	An online file-hosting program that allows documents to be stored and shared	www.dropbox.com
EditGrid	Online spreadsheet with real-time updates and collaboration	www.editgrid.com
Prezi	Online presentation editor with a novel graphic interface	www.prezi.com
SlideShare	Post presentations to access them anywhere or share them with learners	www.slideshare.net

use of social media tools, rapid publications, and disconnect from interpersonal interactions seem to lead to lower inhibitions on the part of the user [18]. Social cues are lost when anything is posted online. A recent study found that 60% of reporting schools had incidents of unprofessional postings on social networks. These violations included profanity, discriminatory language, depictions of drug and alcohol use, sexually suggestive material, and inappropriate “friending” of patients, as well as frank violations in patient confidentiality [19].

In a review of postings on Twitter, Chretien *et al.* [20] found that roughly 3% of tweets posted by physicians could be categorized as “unprofessional.” Topics included profanity, sexually explicit material, discrimination, and potential violations of patient confidentiality. Posts are not anonymous: investigators easily identified 92% of the physicians who had posted the unprofessional content.

Patient privacy deserves special mention. Recent news articles have highlighted the need for respect for privacy. In one well-publicized case, an emergency physician was dismissed from her hospital and reprimanded by the state board of medicine following a privacy violation on Facebook. The physician did not post a name or a picture, but she shared enough information that the patient was identified by a community member [21]. Increasing awareness among medical care providers and students regarding the risk of privacy violations despite attempts to de-identify data may mitigate some of the risk. Many users are not aware that certain social media platforms have the ability to reject simple photo edits, thus revealing hidden identifying

features from a patient's photo. In the end, it is generally a bad idea to vent or gripe about a patient encounter or an exchange with a coworker on one of these sites, as you can never control who will be able to see and read your posting.

Because of social media, students now arrive in health care with a preexisting digital footprint. One trait of web-based media is that they allow information, private or public, to be persistent, searchable, and replicable. In addition, audience may remain invisible to the owner of the information. Students may fail to realize that some of these audience might have a role in their future plans as, for example, residency directors and employers, who are increasingly using social media to screen applicants [22]. The information posted may remain online years after the student has matured and grown professionally [23]. Digital footprints can be cleaned up by the following methods, as recommended by Desai and Katta [22].

- 1 Google yourself regularly to identify troublesome material.
- 2 Use available privacy guards and blocking tools.
- 3 Closely review posted material to ensure that you are displaying material in a professional manner.
- 4 Consider your audience. Material suitable for family and friends may be viewed differently by employers.
- 5 Remove inappropriate content.
- 6 If you are unable to remove content then contact the site owner and politely ask to have it removed.
- 7 If the content cannot be removed then be prepared to discuss it.
- 8 Consider using separate accounts for professional and private purposes.

Schools have taken steps to reduce unprofessional behavior online. Many have adopted "social media policies" [24]. The American Medical Association has developed a policy for physicians [25]. Students who are transitioning into medicine from other fields with less stringent expectations of professionalism are looking to schools to provide better guidance on the high standards set in the medical field [26].

Professionalism is a subjective trait that is not easily defined. One systematic review found more than 90 traits that could be considered an aspect of professionalism [27]. If a teacher considers professionalism as context dependent, he or she can review it independently in the clinical, virtual, and university realms [28].

Simply stated, do not post anything that you would not want your patients, parents, or future employers to read on a billboard in the middle of a town. Posting on a social media site is like placing a message on billboards in every town, not just your own.

Collaboration and ownership

A growing area of concern for educators using Web 2.0 is how to obtain credit for the work they have done. While it is simple to cite original research, presentations, podcasts, blogs, and publications on a curriculum vitae, it is more challenging to cite your work on a wiki that might be edited by many others and not truly reflect your contribution when others look to cite it. In addition, promotion committees may not comprehend an individual faculty member's contributions to Web 2.0 resources [29]. Like other activities for clinical teachers, tracking academic productivity through teaching portfolios may ameliorate some of these concerns. Eventually, however, new assessment methods will be needed.

Conclusions

Web 2.0 has the potential to forever alter the relationship between teachers and learners. New technologic options allow teachers to step out of their traditional roles as lecturers in front of a classroom. We can now learn and share in an interactive manner anytime and anywhere. With the recent endorsement of the Accreditation Council for Graduate Medical Education for expanding the use of asynchronous learning in residency programs, we are sure to see an increase in the use of these technologies to educate our future physicians. The tools mentioned in the chapter make it easier to provide asynchronous learning opportunities and offer the potential to enhance learning in ways never seen before. Educators can expand their audience beyond their own institution by developing a following on podcasts or blogs. Effort and time are needed to learn about these new tools and to design teaching modules that they can support. Despite the inherent learning curve, Web 2.0 technologies should be widely adopted by educators and students alike to promote the collaborative growth and dissemination of knowledge.

Recommended reading

- Blogs, Wikis, Podcasts, and other Powerful Tools for Classrooms [1]
- Podcasting Bible [10]
- Personal Learning Networks [30]
- Web 2.0: How-to for Educators [31]
- Web 2.0: New Tools, New Schools [32]

Summary points

- 1 Web 2.0 consists of dynamic content that can consist of audio, video, photographs, text, and graphics, which aid in collaboration, communication, and dissemination of information.
- 2 Wikis, blogs, and RSS feeds are an easy way to instantly publish information that can then be disseminated around the world, or more tightly controlled for a small group of individuals.
- 3 Podcasts, video, or audio are an excellent tool to help augment learning in visual and audio learners.
- 4 Social networks (e.g., Facebook, MySpace, LinkedIn) are great resources for networking and dissemination of information, but they must be used carefully because their ease of use makes it very easy to post information that can violate privacy policies or be deemed unprofessional.
- 5 LMSs (e.g., Moodle, Blackboard) are all-in-one solutions that provide the educator the ability to run an entire curriculum online. These systems can track assignments, administer and grade tests, and have forums that can be used to generate online discussions. Their online presence allows them to be used 24 h a day, which can increase the student's exposure above and beyond what they would obtain during a regular scheduled class.

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CHAPTER 10

Teaching the intangibles: professionalism and interpersonal skills/communication

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Communication and professionalism

At its core, professionalism is the ability to suspend self-interest for the benefit of patients and their family [1]. Inherent in professionalism is commitment to honesty, proper use of the physician's authority, and an acceptance of accountability [1–3]. Professionalism is displayed through actions and words, so professionalism and communication are intertwined. The governing bodies of emergency medicine agree that communication and professionalism are essential to successful medical practice and expect evaluation of professional attributes to achieve and maintain certification. This chapter attempts to offer practical advice for this education and evaluation.

Fundamental values of professionalism are widely shared. Medical students throughout the world take an oath on graduation, as they are formally accepted into the profession of medicine. One commonly used oath is the Declaration of Geneva, which is offered by the World Medical Association. The new physicians pledge to serve humanity, behave with dignity, act with respect, and maintain the patient's interest as the primary consideration (Table 10.1).

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Table 10.1 The World Medical Association Declaration of Geneva, adopted in May 2006.

At the time of being admitted as a member of the medical profession:
 I solemnly pledge to consecrate my life to the service of humanity;
 I will give to my teachers the respect and gratitude that is their due;
 I will practise my profession with conscience and dignity;
 The health of my patient will be my first consideration;
 I will respect the secrets confided in me, even after the patient has died;
 I will maintain, by all means in my power, the honour and noble traditions of the
 medical profession;
 My colleagues will be my sisters and brothers;
 I will not permit considerations of age, disease or disability, creed, ethnic origin,
 gender, nationality, political affiliation, race, sexual orientation, social standing or
 any other factor to intervene between my duty and my patient;
 I will maintain the utmost respect for human life;
 I will not use my medical knowledge to violate human rights and civil liberties, even
 under threat;
 I make these promises solemnly, freely and upon my honour.

In USA, as graduates of medical school proceed through specialty training, the Accreditation Council for Graduate Medical Education demands the demonstration of professional competencies. Training programs must provide evidence of training and assessment of these standards. According to the common program requirements,

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Residents are expected to demonstrate:

- (1) compassion, integrity, and respect for others;
- (2) responsiveness to patient needs that supersedes self-interest;
- (3) respect for patient privacy and autonomy;
- (4) accountability to patients, society and the profession; and
- (5) sensitivity and responsiveness to a diverse patient population,
 including but not limited to diversity in gender, age, culture,
 race, religion, disabilities, and sexual orientation. [4]

In the specialty of emergency medicine, the American Board of Emergency Medicine (ABEM) requires that physicians provide evidence that patients have evaluated professional qualities and communications skill. This patient evaluation is required for the physician to maintain board certification. ABEM requires that data from patients be presented on the following behaviors related to communication and professionalism.

1. Communications/listening, for example

- *Communicate clearly with patients and other medical staff by listening carefully and couching language at the appropriate level for the listener*

2. Providing information, *for example*
 - Explain the clinical impression and anticipated management course to the patient and the patient's family
 - Provide information about tests and procedures
 - Give the patient options
3. Showing concern for the patient, *for example*
 - Show respect to the patient and other medical staff
 - Make the patient feel comfortable by asking if they have any questions or concerns and act to address their concerns
 - Ask the patient about adequate pain relief [5]

In order for academic faculty to ensure that residents develop these skills and maintain them, the following recommendations are provided.

Recommendation 1: Establish and evaluate explicit standards, beginning with the selection process

When it is known that professional attributes are part of the hiring decisions, it becomes clear that they are valued. Attributes outlined earlier should be embedded by listing the expected behaviors and skills as hiring criteria. Then, these skills and behaviors should be assessed as part of the hiring process. Currently, it is more typical that general observations occur in an attempt to identify deficiencies and potential problems. It is more useful to undertake affirmative questioning, asking candidates how they have displayed expected professional skills. For example, an applicant can be asked how they have displayed compassion or integrity in patient care. Some candidates will come up with concrete personal examples. Other candidates will make general statements or brush off the question. Interviewers should probe to discern the behaviors and attitudes that the person displays during the course of their work. Furthermore, candidates can be asked about situations that challenged their ability to show respect. Prospective residents and faculty can be asked to describe times when it was difficult to be responsive to a patient's expressed needs and how they handled the situation. With skilled probing, a picture of the person's professional values and behaviors will emerge. When interview questions are attempted at assessing how the person manages professional and communication challenges, the values of the organization as well as the candidate are highlighted.

Recommendation 2: Discuss the benefits of professionalism

To effectively teach professionalism and communication skills, it is helpful to outline their benefits for students, as the importance of this

topic is often underappreciated by physicians in training. Explicit discussion is worthwhile in order to remind the trainee of the following.

- 1 Effective communication and professional behavior will enhance interaction, promote an accurate history taking and physical examination, minimize conflicts, and avoid distractions and misunderstandings.
- 2 No other medical concept will have as profound an effect on the work environment, with the potential to enhance effectiveness, efficiency, coordination, and teamwork. Conversely, ignoring professional behaviors can have extremely negative consequences.
- 3 Proficiency in communication can serve as a powerful tool to
 - a foster greater cooperation among consultants;
 - b improve the efficiency of the medical team [6];
 - c increase the amount of information gathered from patient encounters;
 - d improve patients' understanding of their visit;
 - e increase patient compliance with the treatment plan;
 - f increase patient satisfaction with the physician;
 - g decrease lawsuits [7–10].

These skills will be essential for an effective and enjoyable career [11]. Being appreciated by patients and staff, feeling respected, and feeling rewarded by medical practice requires effective human interactions, marked by professionalism and communication skill.

Recommendation 3: Promote openness to continual growth through feedback

With standards and expectations set, professionalism and communication can be taught. During apprenticeship in the ED, when learning is observational and participatory, near-peer and senior physicians serve as role models and are the dominant influence on the student's learning. When the role model offers a good example, an insight, and feedback, the trainee can improve more rapidly. The trainee's experiences alone, in the absence of feedback, are less effective and can lead to overconfidence and perpetuate incorrect actions. Expertise is best developed when direct feedback is provided. Teachers must be willing and able to model excellent behavior, observe behaviors of the trainees, and provide feedback.

Feedback is neither judgment nor criticism. Feedback is a helpful observation that enables the learner to be more effective in the future. Everyone has deeply held attitudes, outlooks, personality traits, and developed habits that could be beneficial or limiting. Human beings do not want to be critically evaluated, and negative judgments are

unhelpful, as they create defensive reactions. Instead, the teacher can be wise, understanding that natural behaviors and instincts of the junior physician will not always be ideal. The teacher can simply offer better ideas about how to interact with difficult patients. The great teacher can help the student recognize patients' anxieties, needs, fears, and frustration and relieve them. The superior faculty member will display mastery of the medical encounter when conflict occurs, deescalating and controlling the situation. Established personalities are unlikely to change, but communication skills can be learned and improved, so honest conversations about what behaviors work are most helpful. A great gift that academic faculty can provide is the encouragement to be open to such discussion. The truly great physicians are on a lifelong quest for personal and professional growth.

Recommendation 4: Observe and discuss negative encounters

Student learners will be exposed to both positive and negative role models [2]. In fact, 98% of medical students in six medical schools reported witnessing unprofessional behavior by their faculty teachers [12]. Negative role models can be educational as well, provided the behaviors are recognized as counterproductive and discussed. Because of the frequency of observed negative behaviors, it is suggested that a discussion forum be provided for in-depth exploration of witnessed behaviors. The students can benefit from the wisdom of the teacher who provides a safe environment and facilitates discussion. The department potentially benefits from the feedback provided by the students.

Deliberate positive discussions are also needed for the learner to reach a high level of performance. Given the extreme demands placed on emergency physicians during a typical clinical shift, it should not be assumed that student learners are picking up on the positive keys to communication and professionalism [13]. If possible, emergency physicians should be aware that explicitly discussing challenging events and interactions can greatly aid those in training [2]. Having shifts where educators are present strictly to tend to the needs of the students, without patient care duties, helps in deciphering positive and negative role model actions and can also serve to evaluate student progress [14]. Other innovative methods of teaching include standardized patient encounters, high-fidelity simulations, and panel discussions, in addition to traditional didactic lectures [11, 15]. In reality, a combination of many of these modalities is required to most effectively teach the complexities of professionalism and communication.

Communication with patients is a very important part of quality medical care. We would like to know how you feel about the way your doctor communicated with you. Your answers are completely confidential, so please be as open and honest as you can. Thank you very much.

1	2	3	4	5
poor	fair	good	very good	excellent

**Please use this scale to relate the way the doctor communicated with you.
Circle your answer for each item below.**

The doctor	poor					excellent					
1. Greeted me in a way that made me feel comfortable	1	2	3	4	5						
2. Treated me with respect	1	2	3	4	5						
3. Showed interest in my ideas about my health	1	2	3	4	5						
4. Understood my main health concerns	1	2	3	4	5						
5. Paid attention to me (looked at me, listened carefully)	1	2	3	4	5						
6. Let me talk without interruptions	1	2	3	4	5						
7. Gave me as much information as I wanted	1	2	3	4	5						
8. Talked in terms I could understand	1	2	3	4	5						
9. Checked to be sure I understood everything	1	2	3	4	5						
10. Encouraged me to ask questions	1	2	3	4	5						
11. Involved me in decisions as much as I wanted	1	2	3	4	5						
12. Discussed next steps, including any follow up plans	1	2	3	4	5						
13. Showed care and concern	1	2	3	4	5						
14. Spent the right amount of time with me	1	2	3	4	5						

The doctor's staff	poor					excellent					
15. Spent the right amount of time with me	1	2	3	4	5						

Figure 10.1 Communication assessment tool survey used by patients to provide feedback to their physicians. Reprinted from [16] Makoul G, et al. Measuring patient views of physician communication skills: Developing and testing of the Communication Assessment Tool. *Patient Educ Couns* (2007). doi:10.1016/j.pec.2007.05.005, with permission from Elsevier.

Formal evaluation of communication skill is beneficial to ensure that observation occurs and feedback is provided. Directly observed patient encounters are important to ensure that students are able to communicate effectively and compassionately. However, the best source of feedback can come from the patients themselves. A very carefully designed and validated tool for patient assessment of physician communication to aid in physician development is provided in Figure 10.1 [16].

Recommendation 5: Outline key components of a patient encounter, including the initial introduction, patient-centered interview, and concluding the visit

A common mnemonic for key components of a patient encounter is the SEGUE Framework checklist [7], which stands for Set the stage, Elicit information, Give information, Understand the patient perspective, and End the interview. This checklist provides basic concepts. The teacher can elaborate and share personal best practices for ensuring a successful encounter. Elaboration and reordering of steps are encouraged to improve on this base.

For example, unlike the SEGUE checklist that suggests gaining an understanding of the patient perspective after all medical data is gathered, it is imperative that the physician attempts to gain this understanding before entering the room for the first time. This may be gleaned from the chief complaint and history provided by the triage process. The first few sentences spoken to a patient can determine the entire success or failure of the interaction. By attempting to gain the patient's perspective before the first meeting, physicians have the opportunity to create trust and favor while avoiding awkward miscues from an inappropriate effect on entering the room. Successfully anticipating the emotions of patients and families is much more powerful than an initial generic approach. Naturally, that understanding will then refine and grow as the encounter progresses.

The initial encounter, including introductions and physical contact

Powerful impressions are made during the first moments of the encounter with the patient. On the basis of the verbal and nonverbal cues, the patient makes an instinctive determination about whether the physician is trustworthy. A key to success in establishing rapport with patients is to ensure an appropriate introduction. In most Western cultures, an offer to shake hands with everyone in the room is appropriate as part of the initial encounter. However, in many cultures, this physical contact, especially between different genders is not acceptable. Regardless of culture, the patient should almost always be the first contact, even if incapacitated, to make clear that he or she is the primary focus of the physician. At some point during the interview, a hand on the shoulder or the arm or a pat on the lower leg can be comforting to many patients and can further convey compassion and empathy from the physician, if acceptable within the culture. Although some people will mandate less intrusion

of their personal space, an appropriate, brief physical contact can create a tremendous humanistic connection between patient and provider. Mastering the initial encounter is a key task for the learner. This requires confidence and exposure to a variety of experiences with veteran physicians who facilitate the process through explicit instruction and role modeling.

The “patient-centered interview”

Once introductions are established, information must be gathered. Creating an atmosphere that enables the patient to freely relate to the physician is critical. Even subtle differences in affect and attitude of the physician can have a significant effect on how forthcoming patients are with their complaints. The following points will maximize the interaction and encourage the patients to provide most information [15–17].

- 1 Maintain proper, respectful eye contact with patients and family.
- 2 When appropriate offer initial statements that show you understand their medical challenges.
- 3 Demonstrate kindness and concern. A warm smile or empathic facial gestures in response to information reinforces the physician’s interest. Verbal expression that you intend to provide thorough, expert care is appropriate, even when warm feelings of concern are absent.
- 4 Ask open-ended questions such as general queries that begin with “how” and “why.” Questions encouraging yes or no answers or short replies limit the opportunity to gather important historical information.
- 5 Add facilitative rather than interruptive comments. Before interrupting or changing the topic, be sure that the patient’s message is fully understood, because patients may have difficulty articulating the information or concerns.
- 6 Give patients the illusion that you have hours to spend with them while limiting the encounter to minutes. This takes skill and experience but can be accomplished by
 - a sitting during the interview rather than standing;
 - b using brief, tasteful interjections of humor when appropriate to the situation;
 - c tolerating short intervals of silence;
 - d accepting moments of nonmedical conversation, thus demonstrating genuine interest in them as a person;
 - e listening deeply to understand how the patient is coping;
 - f offering expressions of caring;
 - g providing appropriate reassurance [15–17].

Not only does the “patient-centered interview” tend to be more greatly appreciated by the patient, it also allows for a broader approach to differential diagnosis, protecting against focusing prematurely on

an erroneous conclusion [3]. Included in this approach should be an inquiry as to what the patient is most concerned about. All too often, patients will go through an entire encounter through discharge without specifically vocalizing their concern that they may have cancer, a sexually transmitted disease, or some other issue. If not addressed, they may erroneously continue to believe their symptoms still represent a particular illness, and the main goal of seeking evaluation will not be met.

Closing the initial interview

After the initial interview, there are important issues to be addressed with the patient: (i) a discussion of possible diagnoses; (ii) an explanation of the tests necessary to narrow the focus; (iii) how long, approximately, the patient can expect to be in the ED; and (iv) any treatment necessary in the interim. It is imperative that this discussion be carried out in layperson terms. It is acceptable and even encouraged to use medical terminology, provided an explanation follows in simplified language.

Concluding the visit

Once all the data has been gathered, concluding the visit involves five main steps that are described in the following sections.

Explaining test results

This requires great skill in translating medical data to layperson terminology. Essential to any discussion should be the degree to which a test is abnormal as well as the limitation of the test. For instance, an “abnormal ECG” may mean nonspecific changes that are unchanged from their previous ECG, to ST elevations of an acute MI. Placing the ECG findings into context for the patient is important, including what needs to be immediately addressed, needs to be addressed sometime in the future, or requires no further action. In addition, informing the patient of the test’s limitations, such as the fact that significant heart disease may still exist despite minimal changes on an ECG, is critical.

Providing a diagnosis when possible or exclusion of pathology when appropriate

Discussions with doctors, to the degree that they occur, are often physician initiated and do not address what the patients wish to know. Patients want to know, “What do I have?” “What should I do about it?” and “When will I feel better?” Discharge instructions from EDs are sometimes not explicit about these questions, instead offer a complicated assortment of recommendations, medications, and instructions to return, which patients do not frequently understand.

Relaying the plan for treatment, future testing, and further evaluation

Whether or not the diagnosis is certain, laying out a concrete plan for a patient is essential. An effective plan takes into account not only medical necessity but also the special physical and emotional needs of the patient. It should encompass alleviation of symptoms, appropriate follow-up, and reasons to seek emergency care again. Communicating this in layperson terms is essential and should ideally be followed by a confirmation that patients have understood the directions. Written instructions should accompany the verbal explanation summarizing the key points.

As an adjunct to all but the most simple of plans, an explanation as to why the chosen approach is in the best interest of the patient should be given. Patients may have unmet expectations that should be addressed. Patients may expect an antibiotic, narcotics, a radiologic test, or even admission to the hospital when the medical indication does not exist. Some patients will accept the physician's judgment, some will not. In any case, an honest discussion with patients and, later, with trainees can be beneficial to all.

Explaining uncertainty that may remain

Some patients will have difficulty managing uncertainty related to a diagnosis but can understand that there are next steps required for reassessment, testing, or treatment. Discussing uncertainty requires parallel discussion of a specific management plan.

Eliciting questions

Finally, patients should be given ample opportunity to ask questions. Crucial to the success of this step is appearing unhurried and open to inquiry. At this point, patients are often exhausted, are overwhelmed, and continue to be intimidated by their care providers. Leaving with unanswered questions decreases patient compliance and therefore leads to worse outcomes. Anything that can be done to promote questions is encouraged. Such steps include staying seated when eliciting questions, directing the inquiry to family as well, and repeating a call for questions after each one is answered.

Recommendation 6: Promote effective leadership through positive communication with all members of the health care team

The physician develops the diagnostic and therapeutic plan but relies on a complex team of nurses, technicians, and therapists to implement it. Clear, respectful, goal-oriented communication is needed for the

plan to be efficiently, safely, and effectively implemented. The leader must also listen. Effective two-way dialog is essential for the most efficient and safe patient care [4]. If physicians discourage nursing input then they will not receive it, thereby limiting insight. An effective team has low friction, high communication, high trust, and mutual respect.

Recommendation 7: Communicating clearly, respectfully, and confidently with consultants

Communicating with consultants provides unique challenges as information is shared and transitions of responsibility occur. Sometimes disagreement and conflict can occur.

There are several issues to the interaction to be taught to the student.

- 1 Often, by simply acknowledging the disruption to their day, consultants become more receptive as colleagues.
- 2 Be specific and clear about what is needed for the care of the patient. The consultants do not wish to listen to a long list of presenting signs and symptoms. They want the bottom line, followed by a discussion.
- 3 A consultant should not provide care recommendations to a patient who she or he has not yet seen. While appreciating the consultants' abilities, an emergency physician is the responsible and accountable person until a transition of care has formally occurred.
- 4 Avoid the misconception that one physician is being called on to help another physician. Rather, two physicians are combining their expertise to help the patient.
- 5 Hear what the consultant is saying. It is helpful to repeat what you hear them say, especially if you then disagree with it.
- 6 Thank the consultant for his or her time and expertise.

Recommendation 12: Be the role model of professionalism

The offhand comments or jokes that are overheard, a too-casual style of dress, and a disinterested and dismissive manner can, alone or in combination, impair trust. It is easy to forget how sound travels in a busy ED, and a single derogatory comment overheard by the patient outside their room can undo all the good rapport that the provider had built up with that patient. While individual caregiver's personal styles, manners, and preferences may be respected, there are limits. As a rule, if the manners, dress, and behaviors do not enhance the trust of the patient, they are probably not acceptable and should follow the norms of the culture within which one is operating.

Remediation of learners having difficulty with professionalism and communication

The approach to remediation depends largely on the reason behind the failure to progress. There are three main groups of people who have difficulty learning the subject:

- 1** the willing student who has difficulty comprehending or grasping the concepts;
- 2** the willing student who is emulating the wrong role models;
- 3** the unwilling student who, for whatever reasons, rejects the concepts.

In case of remediation of the first group, supervised simulated patient encounters may be the most beneficial. Watching how the student responds to various scenarios, followed by a brief discussion of how an experienced emergency physician would respond, will help the learner to develop an approach for a variety of situations.

The second group of students may be best served by direct observation by a dedicated educator during a given period in the ED, who is free from clinical duties. Active discussion about positive and negative role models can help guide the student in the right direction.

The third group often represents the most challenging students to remediate. Temperament, personality, or outlook will not change quickly, if at all. Still, specific behaviors and skills can be developed. Motivation must first be maximized by assuring that the student understands the consequences of poor communication. Hard information regarding the increased likelihood of malpractice claims, job dissatisfaction, and poor career progression should be provided. This can be accomplished sometimes by spending time at the human resources and quality assurance offices. Accumulating a case file of legal settlements against ED physicians nationwide can serve as excellent studies in the subject. The first skill to develop is the demonstration of emotional control by avoiding outbursts. Specific additional skills are abilities to sit and listen to patients, to avoid making negative statements, and to avoid making judgmental comments. These skills are the basic and necessary attributes in the journey toward positive communication habits.

Finally, perhaps no other area of medical competency is as sensitive to troubling personal issues as professionalism and communication. For those students demonstrating severe deficiencies in this area, educators must be vigilant for signs of depression, substance abuse, and other strains of student life. Often, rapid and aggressive intervention in these areas is all that is necessary to correct the deficiencies of these core competencies.

Conclusion

Good communication skills are critical to a successful and rewarding career. Clear standards and expectations must be set, even if individuals are selected as residents and faculty. The environment in which emergency physicians must function is filled with challenges and potential barriers. Skills can be learned by observing role models, discussing challenging situations, and receiving feedback from trusted advisors. Teachers must first create the motivation to learn and then provide an effective, positive approach to conveying these complex concepts. If successful, this knowledge will lead to respect from and appreciation by patients and peers alike, enriching interactions on professional and personal levels throughout life.

Summary points

- 1 A learner should be observed directly in patient encounters at least once in a shift.
- 2 A learner should observe the teaching physician during a patient encounter at least once in a shift.
- 3 Be aware of teaching moments during interactions with nurses, ancillary staff, and consultants.
- 4 Be aware of negative role models and how they are affecting the learner.
- 5 If the teaching physician encounters a particularly difficult patient or situation, the learner should understand that these are the most valuable teaching opportunities to talk through during or soon after the encounter.

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CHAPTER 11

Teaching lifelong learning skills: journal club and beyond

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Incorporation of research-enhanced practice into graduate medical education

As a result of increasing governmental support for medical investigators, the volume and complexity of clinical research have increased significantly since World War II. The proliferation of print and online medical journals along with secondary peer-review sources produces an environment in which every clinician is flooded with allegedly superior tests or treatments on a daily basis. In fact, the “number needed to read” to identify one clinically pertinent manuscript in one emergency medicine journal has been estimated to be 26 [1]. The low signal-to-noise ratio for the information overload often causes clinicians to tune out the majority of research as a self-defense mechanism [2]. The unintended consequences of truly revolutionary clinical advances are an unacceptable delay in the incorporation of the advances into routine practice and guideline-driven care, sometimes as long as a decade [3].

A means of avoiding this delay in knowledge translation is building a sound foundation in evidence-based medicine (EBM), which is often established during residency training [4]. However, numerous barriers need to be overcome to ensure that emergency medicine residents acquire and maintain the skill sets necessary to efficiently find, appraise, and archive medical science germane to their daily

practice [5, 6]. One challenge is finding the optimal format and setting to teach EBM [7, 8]. Although the bulk of nonbedside learning has traditionally occurred in didactic settings, an increasing body of educational research suggests that knowledge acquisition and retention in classroom and continuing medical education settings is unacceptably low [9]. Journal club is another mechanism to review research findings, but educational trials have not demonstrated that this technique is superior to traditional didactics [10–16]. If EBM lessons could be encapsulated succinctly at the bedside during clinical rounds, new knowledge retention would probably be more likely. Unfortunately, such “knowledge translation shifts” have not yet been systematically evaluated either.

The barriers to integrating EBM into graduate medical education (GME) curricula extend beyond the format. Significant obstacles can be identified among those who would teach the skills, too. One survey of emergency medicine program directors revealed several barriers to EBM curricula. Only about 20% of programs had at least one faculty member who had attended well-recognized EBM workshops such as the McMaster University Evidence-Based Clinical Practice course [17]. Accordingly, the survey respondents noted the following barriers to incorporating EBM lessons into GME curricula: lack of faculty time (71%), lack of trained faculty (60%), lack of interested faculty (49%), and insufficient funding (43%). Nonetheless, more than half of their program directors teach EBM principles to their trainees and 25% have an established journal club curriculum [5]. GME leaders believe that the most important outcome of an effective EBM curriculum is enabling graduates to differentiate between minimally and significantly flawed studies. Emergency medicine program directors believe that residents should become familiar with secondary peer-reviewed sources rather than becoming experts at critical appraisal [4].

Worldwide access to biomedical information via the Internet

Several useful electronic resources are available to assist EBM scholars without ready access to a medical library [18]. The National Institutes of Health/U.S. National Library of Medicine maintain several online resources that are accessible from anywhere in the world. PUBMED (<http://www.ncbi.nlm.nih.gov/pubmed>) is a massive database of citations from the biomedical literature and can be freely accessed from anywhere in the world [19, 20]. MedlinePlus (www.MedlinePlus.gov) offers consumer health information without the advertising bias of other online resources. The Turning Research Into Practice (TRIP, <http://www.tripdatabase.com/>) database is a free online resource that

simultaneously searches several electronic databases before providing a hierarchy of evidence quality [21]. The TRIP database can also translate search findings into six different languages. Additional customizable search engines that find research evidence and stratify by the strength of study design are being developed [22].

Regional medical libraries can obtain manuscripts at a reduced cost and help rural physicians to locate an ordering library and set up a Loansome Doc account (http://www.nlm.nih.gov/pubs/factsheets/loansome_doc.html). Small hospital libraries with at least 25 lendable holdings can participate in DOCLINE (<http://www.nlm.nih.gov/docline/>), an interlibrary loan system. The HINARI Programme (<http://www.who.int/hinari/en/>) is a collaboration between the World Health Organization and publishing companies. Its purpose is to provide clinicians in developing countries free or low-cost access to biomedical and health information. At the time of writing this chapter, 160 publishers were participating in this program, providing access to 8000 information resources.

Characteristics of poor evidence-based medicine/journal club curricula

Many design and organizational flaws limit the usefulness of journal club and EBM curricula in GME (Table 11.1). The single most important determinant of a journal club that fails to provide residents with lifelong learning skills to find and appraise practice-changing research is the lack of an opinion leader who is solely responsible for the content and quality of every lesson each year [23, 24]. Without a solitary figure, the journal club can devolve into a disorganized, anecdotal-opinion-laden shouting match without a structured take-home lesson. Some programs leave journal club organization to the chief residents with sporadic and highly variable faculty support. This approach fails to tap the educational, research, and clinical expertise

Table 11.1 Characteristics of an unsuccessful journal club.

- Lacks single faculty opinion leader
- Suboptimal manuscript selection
- Failure to use formal critical appraisal instruments or archive results for asynchronous learning
- Research nihilism
- Statistical uncertainty
- Insufficient individualized feedback
- Evidence-based medicine decision making is not supported at the bedside

of seasoned faculty and burdens residents with a task for which they are only partially trained. Without formal EBM training or supervision, residents often select lower-quality manuscripts [25]. If the articles selected for review lack applicability to emergency medicine populations or possess fatal flaws that limit their validity, residents learn to believe that clinical research is usually erroneous, never ready for the bedside, and therefore should remain in the purview of the academicians (research nihilism).

Residents and faculty members commonly misunderstand or misinterpret statistical concepts [26]. While an understanding of hypothesis testing and related statistical assumptions is a component of every original research manuscript, healthy skepticism mandates that astute clinician-scientists incorporate new findings within the context of their own medical experience [27]. This process requires clinicians to understand the difference between statistical and clinical significance while contemplating the myriad forms of bias that can distort the summary estimates of any medical research. Nonetheless, simple statistical tests such as kappa values can be computed during journal club sessions using sample data to illustrate the computational concepts and perhaps remove some of the mystery behind these numbers [28]. All medical skill sets (e.g., history taking, physical examination, procedures) require repetition with structured mentoring to isolate and correct errors. Similarly, the evolution of a resident's critical appraisal skills requires repeated exposure to structured evaluation forms with graded feedback on a predictable basis [29]. Without a structured evaluation form, residents might ask the wrong questions of the available evidence and miss essential take-home points that even the most biased, inaccurate research can provide.

Another obvious deficiency of journal club formats is that they are physically and temporally disconnected from clinical care, thus giving the appearance that they are a purely intellectual exercise. If journal club and didactic EBM leaders fail to summarize the results of the search strategy, the critical appraisal of the article, and the group's opinion in a readily accessible format, those who could not attend the session will not have the opportunity to learn from the session. In addition, those who did participate are likely to forget the specifics of the discussion except for the most poignant lessons.

Attributes of the successful evidence-based medicine curriculum and journal club

The perfect journal club has yet to be described, and the concept of EBM has yet to demonstrate evidence of superiority or improved/cost-effective patient-centric outcomes [30]. Nonetheless, EBM does

provide a theoretical framework on which clinician–educators can begin to link research evidence with physicians facing an information overload. However, several high-yield formats that facilitate residents' uptake of EBM knowledge have been described and are summarized in Table 11.2 [23, 31]. First, recognized EBM curricular leaders generally funnel these efforts through a single-thought leader and established journal club format. These opinion leaders usually share responsibilities of the monthly journal club with other faculty members in order to teach the teacher how to provide structured EBM lessons in a controlled environment away from the busy ED. Inviting faculty members to participate in these sessions builds a critical mass of EBM expertise within an institution while motivating less confident teachers to seek training through widely accessible and critically acclaimed courses [17, 32]. Faculty buy-in can be enhanced by ensuring that the quality of the end product is sufficiently high to merit a peer-reviewed publication in most cases, thereby providing busy clinicians with academic currency for their efforts rendered [4].

Effective journal club events are usually planned several months before the event with the search strategy focused on a PICO question (PICO: Patients studied, Intervention/Test evaluated, Control group/test for comparison, Outcome(s) of interest) planned in consultation with a medical librarian [7, 33]. The educational quality of the journal club depends on the behind-the-scenes organization that

Table 11.2 Successful journal club attributes.

Having a single faculty leader
Organizing sessions more than a month in advance
Inviting pertinent non-EM specialists to participate
Incorporating formal critical appraisal instruments
Supporting asynchronous learning via
– archived summaries
– one-on-one monthly feedback
– toolbox CD
Accessing online statistical support
Surveying participants annually to identify strengths/weaknesses and fresh ideas
Enhancing faculty participation with publication and other peer-reviewed opportunities for academic credit
Providing EBM summaries at the bedside
Giving an occasional break from rigid critical appraisal focus in favor of related EBM content review
Rewarding resident participation
Constant evolution of the format using organized medicine interest group expertise

Drawn from [23, 31].

precedes the event by several months (Figure 11.1). For example, the overall journal club leader can survey the learners anonymously at least once a year to identify the clinical topics of highest interest to the most residents. These topics are then matched with individual faculty members who have personal or research interests in that domain. By doing so, coinstructors from specialties other than emergency medicine can be identified. For example, if the topic is the optimal

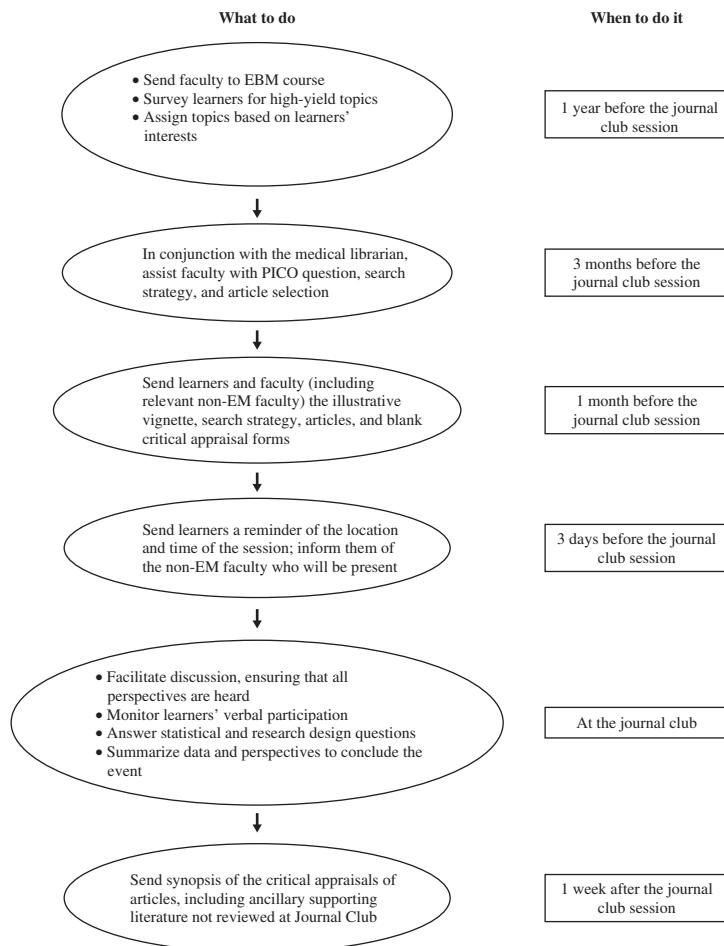


Figure 11.1 Flow diagram for an effective monthly journal club organizational structure.

ED diagnostic strategy for pulmonary embolism, then radiology, critical care/pulmonary medicine, and thrombosis specialists should be involved in the development of the PICO question, the search strategy, the article selection process, and critical appraisals. Ideally, the critical appraisal for each manuscript can be summarized in a few sentences, including the pertinent limitations of the research design.

Although the journal club/EBM opinion leader should participate in all these preparatory phases, he or she should allow the organizing faculty member to set the pace and tone of the discussion. When the journal club opinion leader is not running the session, his or her role is to answer any methodological questions that were not answered, ensuring that the most significant limitations of the study have been verbally acknowledged so that all learners understand the complexity of medical research [2]. However, if the highest quality research has been selected for the topic, attendees should not walk away empty handed [34]. Instead, the bottom line of each manuscript should be emphasized within the constraints indicated by the limitations of the study or report. Every resident should be encouraged to verbally participate, and no question should be left unanswered when a confident truth exists. When an individual resident or faculty member routinely takes control of the discussion at the expense of all others, breaking the larger group into smaller segments (e.g., by residency class) can ensure that all voices are heard. When this small-group approach is used, the session should reconvene as a whole allowing ample time to incorporate the lessons learned from the bulk of the literature, so that nobody forms an opinion based on one manuscript.

Asynchronous learning describes the educational opportunities that present at different times, an essential consideration when working with shift workers such as emergency physicians. Once the journal club has concluded, residents should hand in their individual critical appraisal forms to be graded. The only method to evaluate individual-level comprehension is by assessing the appraisal of an actual manuscript. One method of grading residents' verbal and written participation and comprehension at the journal club is presented in Table 11.3 [29]. The graded critical appraisals can be used as evidence of the practice-based learning core competency [35]. The summary answer keys completed by the journal club faculty organizers should include the valid viewpoints of all attendees.

An educational toolbox is a collection of useful resources (e.g., manuscripts, lectures, online calculators, professional organizations, journals, and blogs) to facilitate learners' understanding and bedside application of material. By providing learners with a free toolbox of well-accepted instruments, didactic resources, and statistical

Table 11.3 Journal club resident participation scoring system.

	Point(s)
Attendance	1
Participation	
Actively led the discussion	3
Said something	2
Was silent as a mouse	1
Not present	0
Written summary	
Exceptional	3
Average	2
Subpar	1
Not turned in	0

Reprinted from [29] Carpenter CR, Katz E, Char D: Re: Journal Club and Teaching Evidence-Based Medicine. *J Emerg Med* 2006, 31(3):306–308, with permission from Elsevier.

calculators, the journal club director can refer individuals to pertinent lessons when particular concepts are misunderstood. These resources can be archived online to simplify access at the bedside or while away from institutional computers anywhere in the world (Figure 11.2). When archived online, these summaries can be used by individuals at the bedside at the original institution and worldwide to facilitate evidence-based decision making.

Conclusions

Although finding research evidence has never been faster than in the Internet era, today's clinicians face an unprecedented and ever-increasing volume of biomedical publications. Furthermore, numerous barriers exist between resident physicians' current curricula and EBM proficiency. GME leaders note the lack of instructor time or curricular flexibility as challenging obstacles against educational programs that build EBM fundamentals. The first step to overcoming these barriers is to designate an individual who will obtain the requisite training that is necessary to understand and teach EBM. If one institutional EBM leader invests the time to develop a sustainable curriculum, learners can benefit from a retrievable archive of critically appraised topics as well as other high-yield calculators and secondary

Summary points

- 1 Like procedural skill sets, acquisition of EBM knowledge is a hands-on proficiency that requires illustrative role models and personalized feedback.
- 2 Barriers to an effective EBM curriculum, including journal club, are insufficient faculty time, training, or interest. Therefore, an essential initial step toward enhancing local educational efforts is identifying and supporting a critical mass of seasoned clinicians to facilitate a productive EBM learning environment.
- 3 Systematically archiving critical appraisal synopses for future and off-site learners promotes asynchronous learning while providing valuable study details to retrieve at the bedside that will promote knowledge translation.

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CHAPTER 12

Medical podcasting 101

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This chapter was “written” by Rob and Scott podcasting their thoughts on podcasting—a meta-podcast, if you will (<http://itunes.apple.com/us/podcast/podcasting-in-emergency-medicine/id310670528?i=108610843>).

Rob: All right, here we go.

Scott: How about an introduction?

Rob: Podcasting presents educational opportunities that were unthinkable only a decade ago. For little cost, anyone with something to say can record a podcast on any subject and broadcast it to the world. Since they are portable audio files, podcasts are available anywhere at any time. This gives podcasting a particular benefit over more traditional means of continuing medical education such as textbooks, conferences, and blogs, in that you can listen when driving, exercising, filling out paperwork, or just lying in bed.

This chapter outlines the basics of medical podcasting, from conception to production to distribution. Let’s start with the first question: What is podcasting?

The word *podcast* is a combination of the words *iPod* and *broadcast*. Podcast distribution takes a number of forms, ranging from direct downloads from a website to real simple syndication (RSS, defined later in this chapter) or, most commonly, from podcatcher software such as iTunes. All of these are means by which podcasts can be made available automatically for listening, on either a computer or a handheld digital device.

Scott: Podcasts allow time-shifting. You don't need to tune in to listen at some set time; you can listen whenever you like. That, along with the fact that you can be doing other stuff like driving your car, has led to podcasts being the up and coming media format for medical education.

Rob: I don't read as many throwaway journals as I used to. Podcasting has taken over that role because I used to read those for the review articles and the expert opinions. With podcasts, that's all coming together in an audio format and I can just listen to it while I'm walking the dog.

Scott: Maybe we should introduce ourselves and tell folks a little bit about our podcasts.

Rob: I'm Rob Orman. My day job is as an emergency physician in Portland, Oregon. The reason you're reading my words here is that I'm also the host of ERCAST (<http://ercast.org>). ERCAST is an emergency medicine podcast, mostly in an interview format, that talks to experts in emergency medicine and other specialties to explore practice patterns and different takes on the literature, asking the questions, "How do other people practice medicine? How can I do it better?"

Scott: I'm Scott Weingart. I'm an ED intensivist. I started the EMCrit podcast about 3 years ago (<http://emcrit.org>). The goal of it is to bring intensive care down to the ED. Make it stuff that you could apply during your next clinical shift to take care of really sick patients at least as well as any intensivist could.

Rob: Let's talk about what you need to start a podcast. Scott and I are asked this question with regularity by people who want to start podcasting: "What do I need?" I think that that question is focused more on what type of hardware is needed—a microphone, computer, etc.

Hardware aside, the main thing you need is motivation. Why do you want to start a podcast? That's what's going to carry you down the road. You've got to have passion and excitement. Why do you want to get into podcasting? The initial spark you get from starting a podcast is going to fade away over time. The moment it feels like a job or drudgery, it's time to recheck your motivation.

Ask yourself, "Is it still fun? Does it feel like a deadline? Does it feel like work?" You should look at podcasting like a hobby, not your job. Something you do that's enriching, not a burden.

Scott: I absolutely agree. What you need to start a podcast is easy. You need a ton of free time to burn doing audio editing! What's more important, you need to have a desire to get your ideas out there. For me, the idea for EMCrit came from giving lectures.

I was making countless lectures for my residents. I'd give them at rounds and then the talk would be dead. All the work and research that I put in: one and done—gone. Podcasting lets you get those ideas out there to a much larger group. That's my motivation. What's your motivation, Rob?

Rob: My brother Rich got me into podcasting. I have to give him credit. He wrote the intro blurb on the history of podcasting at the beginning of this chapter. His show has a nonmedical subject matter, but I thought I could start with his format and turn it into a medical education show. I've always had projects going on that required time and research: improving how my ED manages atrial fibrillation, CHF, PE in pregnancy, etc. One of the things I really liked about doing those projects was talking to experts in other fields and seeing how they think about acute medical issues. Believe me, it's not always the same as emergency medical thinking. When I started ERCAST, I hosted interviews with specialists from other fields, which I dubbed "curbside consults," since it was akin to stopping a colleague in the hallway and asking, "Hey, what do you think about this case?" At the end of the day, it's all about teaching.

After 2 years of producing monthly shows, it's still fun. Unlike other hobbies, though, all the material is right there at my day job. Clinical question? Bang! It goes right into the podcast.

Scott: Absolutely.

Rob: It also makes your job better. Because you're researching this stuff, the next time you see a patient who has a particular condition or particular issue, you've got all that knowledge behind you and that's one thing that really makes work fun.

Scott: So, we have down that people need to be motivated if they want to make this happen. What do you need next, Rob?

Rob: The big question I had when starting a podcast was what kind of hardware to get. Do I need a microphone and a computer? Most people have a computer, so what you need is a microphone, a podcasting microphone. I bought a Blue Snowball mic since that's what my brother uses. Which one do you use?

Scott: I'm using the Rode Podcaster, which is the Mercedes Benz of podcasting mics. I started off with a Samson mic I got for \$40. You just need it to be above a certain bar. For people who have no audio experience whatsoever, I don't recommend buying standalone microphones. I think you should probably get a headset mic. Not the dirt cheap ones that come with your dictation software, but something in the \$50 range (Table 12.1). Along with being a mic, it's going to give you the headphones, which you need as well. It's also going to keep a consistent

Table 12.1 USB microphones for podcasting.

Low end
Logitech or Plantronics headset mics (anything in the \$30–\$50 range)
Samson Meteor
MXL 990
Audio-Technica AT2020
Higher end
Rode Podcaster
Blue Snowball
Blue Yeti Pro

distance between your mouth and the mic. For the beginner, the most important thing is getting good, consistent audio. No matter what you choose, get a USB microphone; the world of analog microphones, amplifiers, and analog-to-digital conversion is way too tough for a beginning podcaster.

Rob: Scott, since we're recording this, how faraway are you from the mic right now?

Scott: A hand's width. You should have the microphone, and then your hand, and then your mouth touching your hand. Then just take your hand away.

Rob: I'm probably about 2 inches away. Do you use a pop filter on your mic?

Scott: I do on this mic. When Rob's talking about pop filters, some of the plosive sounds, like *p*'s, tend to cause spikes in the audio. If you've ever heard audio with popping *p*'s, it's unlistenable. The solution is a mesh filter that will take the pops away. Some mics need them, some don't. You just have to experiment. Many computers will have built-in microphones. I don't recommend using those. How about you?

Rob: I have had at least one episode of ERCAST that I thought was being recorded on my good microphone, which was inadvertently turned off. Instead, it recorded on the computer's mic. I'm looking at that mic right now. It's sitting next to the little camera on the computer monitor and is about the size of a pinhole. The sound quality is terrible.

Scott: We just strolled into the second thing you need. I briefly touched on it, but you need to be monitoring your audio as you're recording. That means you either need a good set of headphones or a headset mic that has it built in. If you're just hoping that what you're recording is good, you might waste 40 minutes of insanely good podcasting material. I highly recommend monitoring with

headphones to make sure that you're recording good-quality audio.

Rob: So you can tell when you're listening through your headphones if it sounds good or not? I've never been able to pick up on that.

Scott: If you're plugged right into your mic with your headphones, you're going to hear if you're peaking. That's the key. We should briefly mention what peaking is. Any audio recording goes down in one of two ways. It's either analog, a good example being your old tape cassette decks. Then there's digital, which is what your computer is going to do. Most microphones that you plug into your computer take analog sound and turn it digital. Digital recordings, which are what all podcasts essentially have to be, are not happy when the sound exceeds their thresholds. If you have sounds that are doing that, then it doesn't know how to process them. So it records them as what we call *peaking*, which is this horrible garbled audio sound. You can hear this only if you're listening through headphones in real time. I have a limiter on mine, which prevents peaking at the computer level. If not . . .

Rob: You have a limiter on your microphone?

Scott: On my software. So I can't peak from that perspective; it will just dumb it down to something that's listenable. You should be listening as far down your audio chain as possible. This means that if you could get your headphones plugged into your computer and monitor in real time, that's even better than listening at your mic.

Rob: You've explained this me about 50 times, and I still don't do it. Probably because I have no idea what you're talking about.

Scott: And you sound great. That brings up the next thing you need. You don't need it, but people aren't going to listen otherwise, which is you need good room acoustics. Why don't you talk a little bit about your setup, Rob? (I should add here that if your audio quality isn't good, people will not listen to your podcast—even if the material is fantastic. You *need* good—not great, but good—quality audio.)

Rob: The room acoustics are huge, and it was definitely a family negotiation for me to get the exact acoustics I wanted. What I started out with was a room with a hardwood floor and nothing else in it, which created a tremendous amount of echo. I would put a towel over my head and microphone to blunt the echo. That was a bit cumbersome, not to mention hot. Eventually, I put a couple of soft chairs and a rug in the room to absorb the sound. What you want is a mixture. You don't want to be all

echo, and you don't want to have all absorption. You want a combination. What I have is about half wood, half rug.

Scott: Some of the most successful podcasts are recorded in clothing closets. That supposedly gives the optimal recording studio, but I just can't bear it.

Rob: As I recall, you've tried a few closet recordings.

Scott: Yeah, I had to come out of the closet. It just wasn't enjoyable, and I'm willing to take a little more echo to be comfortable. I will say New York City is the worst place to record a podcast because the construction is so shoddy.

Rob: Let's talk about the recording software that we use to record an episode. That's really what it comes down to. Your mic is only as good as your software and vice versa. We have very different approaches to how we do audio. I went for the most basic freeware program called *Audacity*. It's free; just download it from the Internet (audacity.sourceforge.net). It does crash occasionally, but there are very few functions—it's simple. I've tried other ones like Adobe Audition and Reaper, but they are way too complicated. All I'm doing is voice. I don't need any other sound modification. Since I use a Mac, I also tried Garage Band, but it just didn't work for me. There are, however, many podcasters who do use Garage Band.

Scott: When people ask me, I tell them: If you're on Windows, go for Audacity, especially when you're starting out. If you're on Mac, go for Garage Band. Though there's nothing wrong with using Audacity on a Mac.

Rob: What program are you using?

Scott: I am using Adobe Audition (www.adobe.com/products/audition.html), but I do not recommend that for anyone. The learning curve on that program is very high, because it is a professional-level program.

Rob: If you were going to start over, what program would you use?

Scott: I have a little bit of audio background, so I'd stick with Audition. For people starting out, Garage Band on the Mac and Audacity on Windows will get the job done.

Rob: Now you've got your voice file and you want to get it out to the world. The next step is editing. We're not going to get into the nuts and bolts of editing—that's a chapter alone.

So what do you need here? You need to get a server, a host, a website. I'm still confused about what each of these things does. I know I've got all of them, but what are the steps that get your website up and running? For the neophyte, it can be intimidating.

Scott: This is going to be the biggest barrier because even though audio files aren't as huge as video files, they're still much bigger than most of the things that are hosted on the web. A web page, even one with many pictures, holds very small amounts of information compared with an audio file, especially a high-quality audio file. If you think you're going to buy one of the \$5-a-month websites and just stick your audio up there, that will work when it's your mom and your brother-in-law listening to your podcast. When you get some listeners, the website company is not going to be happy, and they're going to tell you that this is not working for them anymore, even if the offer said "unlimited." So you need to host your podcast somewhere that can handle the bandwidth, or how much space it's occupying multiplied by how many people want it and are downloading it. Both you and I, Rob, use Liberated Syndication, or Libsyn (<http://libsyn.com>). It gives an all-inclusive package for whatever set amount of bandwidth you want. For example, I'm on a 400-megabyte-a-month plan, which means I can give them up to 400 megabytes of audio a month, and no matter how many people download, I don't have to pay a cent more. Which plan are you on, Rob?

Rob: I'm on the 200-mb plan. Libsyn is a one-stop shop. It can get you up and running to start a podcast.

Scott: And they're probably one of the more reliable podcasting hosts. So I recommend Libsyn (Rob and I are taking no money from the companies we mention). If you're going to do it for free, and you're in an emergency medicine department, I recommend talking with your department's computer person. Tell them, "Look, I'm starting this podcast and hopefully it's going to be departmentally approved." We should come back to that, Rob, and talk about social media and getting departmental approval. Let's pretend you've already done that and your chair or your director says, "Yeah, this sounds like a great idea!" The department might be able to host it for you, and it might be able to take care of the bandwidth and the technical details for you. In either case, what you're going to get from either a storage company such as Libsyn or your department is a URL that links to the audio file. It will look something like this: <http://libsyn.com/emcrit/podcasts/sample.mp3>.

Rob: What is a URL? I'm asking that because I don't know what that stands for.

Scott: Uniform resource locator. It's just that web address you punch into whatever browser you use and it points to a location on the web. This one is pointing to your MP3 (MP3 being that

small audio format suitable for web posting that Rob will talk about a bit later). So you're going to get, from either Libsyn or your department or whoever's hosting, a URL that would point to your audio.

You might think, "OK. Great. I have my MP3 and I can email my friends and tell them to listen to my podcast, and give them the URL address." That's not going to work long term. Eventually, you need to put your podcast link somewhere that people can go to and find it themselves. That's really the next step: making a home on the web for your show. How did you start off in that vein?

Rob: I started off with the Libsyn all-in-one package. It was overwhelming to do all of these steps that we've talked about. I didn't know one iota: how to use the mic, how to use the software, how to get my stuff uploaded. I still use Libsyn to host my audio files, but my show is now on the ERCAST website, which is a wordpress.com blog site.

Scott: Now that you're on a WordPress.com site and the next option is a blog. Do you have a working definition of a blog, since your brother supplied you one for podcasting, Rob?

Rob: Web log?

Scott: Correct! It was built so people can have their diaries, their everyday life, on the web and that's how these blogs got started. Blogs have expanded to be much more and now they are any website that's updated on a regular basis. The term *blog* has expanded way beyond its beginning as a *web log*.

Rob: Before I forget, I should mention audio formats. You're talking about bandwidth and I want to go back to something that is a very small detail but makes a big difference when you're putting your files onto Libsyn or wherever you're storing your files and people are accessing them. The type of file that you use for manipulating data on your computer is different from the one that you want to put on the server. AIFF and WAV files are high quality but use about 10 times more space than the smaller MP3. If you use the bigger WAV or AIFF files, it's going to quickly fill your storage space. Whereas, if you use MP3, you're going to be able to put up a lot more shows.

Back to blogging—does blogging seem a little bit weird to you, in the way that *The Truman Show* seemed a little bit weird? When everybody's following the life of this one individual and thinking, "Who would want such an invasion of privacy?" Now, it's just out there.

Scott: Yeah, well, it's a new generation and they're supposedly happy to share everything about their lives, but we can't speak

to that. What I can say though is that a blog is a natural fit with a podcast. Because, as you release an episode, you're going to put up a blog post to accompany it and those become the show notes for that episode. You can add links to the things you spoke about, you can give shout-outs to people. There are also things you may want to say to your listeners that you don't necessarily want to put in the podcast form. You can do a post on your blog that doesn't have a podcast associated with it. You're not going to find too many podcasters out there that aren't doing some form of blog as well. Even your Libsyn website was essentially a blog. It was just a blog done by Libsyn.

Rob: I guess it was a blog; I would occasionally put up posts that were not related to podcast episodes.

Scott: Then you get to the next piece of the puzzle, which is to have your podcast sitting somewhere with a link. You put that link up on your blog, but then you want to have that next step, and that's RSS. It stands for real simple syndication. The idea behind RSS is that it's a single step for updates to be transmitted to other programs or devices without you having to do anything, except the initial step of saying you want to subscribe to wherever that RSS is pointing. So if you click subscribe on my website, and you happen to be using iTunes, iTunes would now link on to that RSS, and from this point forward, every time I publish an episode, it will automatically be brought into iTunes.

This was the key to podcasts catching on because people didn't have to keep going to the site and checking to see if a new episode was out. It was pushed to them through RSS.

Rob: iTunes was the game changer. It's still the podcast subscription juggernaut.

Scott: Absolutely, they own the lion's share. There are people, surprisingly, because I have these data, who will come to my website, sit on my website, and play the entire episode while they're there on the web. More power to them, I think that's fantastic and I make that possible, but they are by far the minority. Most people are using some kind of device like an iPhone or MP3 player. Even if they're listening on their computer, they're doing it through a podcasting system like iTunes.

Rob: It's interesting. I listen to shows on your website's audio player about 50% of the time. Maybe I'm just Generation X, not quite ready for that extra step into RSS feeds.

Scott: I'm not looking down on you buddy—it's all good. That's what it's there for. We can't go into much greater detail or we'd take up the entire book. This brings up the next question. I don't think many folks who are reading the chapter or listening are

necessarily going to be starting a podcast, but they could use the things we've talked about to do some very powerful stuff that doesn't involve committing to regularly putting out episodes.

What came to my mind is this scenario: if you are going to do a grand rounds talk, you can record it and put it up on your departmental website and have that great lecture available so that the residents who didn't come could listen and other people around the country could also hear your lecture. What do you think about that?

Rob: I think that's fantastic. That's kind of like Joe Lex's Free Emergency Medicine Talks (freeemergencytalks.net).

Scott: We should mention that. Because if you did record one of these podcasts and you didn't want to deal with any of the technical stuff, you could just send it to Joe Lex.

Rob: Joe Lex, what an icon!

Scott: Indeed. Free Emergency Medicine Talks. Joe will take any good-quality lecture, put it up on a site for you, and host the audio. Then your audio can be pointed to from wherever you like to Joe's site.

Rob: A lot of what you're talking about seems to be the new trend in resident education, which is asynchronous learning.

Scott: Why don't you talk about that for a bit?

Rob: Historically, it's been go to a lecture, have the information shoved down your throat, and hopefully you absorb some. With asynchronous learning, there's material online, podcasts, different educational elements that are happening outside that formal didactic structure. What you're talking about fits perfectly with what's really a better way to learn. Doing it on your own time, not sitting through multiple lectures in a row, and hoping to absorb three useful pieces of information in 4 hours.

Scott: Let's say you're scheduled to do your yearly talk to the residents on some core topic. You could get up there and give a lecture straight out of Rosen's. The audience is going to be bored, and you're probably going to be bored doing it. Instead, what if you recorded that semiboring lecture over the course of 15 or 20 minutes, sent it to them a few days beforehand, saying, "Listen to this, and rather than me giving the lecture in front of you and wasting your time when we're face to face, what if we just rapped about a few cases and talked through some questions about what you listened to during the hour, where normally I'd just be sitting up there and people would probably be bored out of their minds."

Listen to the 20-minute lecture and then in real time do a *sim* case with some discussion, a few real-world cases. That sounds like a lot more fun.

Rob: I've tried to do this for a lecture I'm giving next year. I just put out a podcast on it last week. I wonder if anyone is going to listen to it beforehand, because what I'd hope is not just give the same lecture over again, but take it to the next level and discuss how people are applying those principles.

Scott: With my podcast, I tell the residents, "You're never going to hear a lecture that's on the podcast. I expect you to listen. I'm not going to require it, but you're just never going to hear me lecture about anything on here. If you want to understand the next level of what I will be lecturing on, listen to the background that's already there."

Rob: An interesting thing that people feel very strongly about has to do with the speed of listening to a podcast. You've got regular speed, half speed, and two-time speed. With double speed, you can listen twice as much as regular speed. For me, it doesn't work. It drives me crazy to listen to the fast voices. You miss the cadence, nuance, and richness. Although, if you're listening for just content, double speed might work for you.

Scott: I can't do 2× either. I listen to everything at regular speed because for me, so much of it is the experience. I could go back to your old episodes and, even though I know the information, I still enjoy listening. I think you're right. It's the enthusiasm, the cadence, the little things that come out of it that make podcasts enjoyable.

Rob: Let's talk about some of the podcasts that we listen to.

Scott: Sure.

Rob: I have some of these on my blogroll, some of them I don't. Obviously, EMCrit, that's the one I listen to first on my list. When I went to start my podcast, I went onto iTunes to see what was out there for emergency medicine podcasts: there were many "flashes in the pan." You look at the podcasts and you say, "Wow, four, five, six, ten episodes and they're done. No new episodes in a few years." It was this EMCrit guy and no one else. I thought, "Wow, that guy is kicking ass."

Scott: You are too kind.

Rob: My podcast was originally going to be called *Emergency Orthopedics*. It was going to be all orthopedics because that was just ...

Scott: You are the ortho man.

Rob: I was going to go into ortho. I love ortho, but obviously I didn't for reasons that we can discuss at some later time. What podcasts I listen to, EMCrit, number one. I listen to SmartEM (<http://smartem.org>). I love David and Ashley. It's awesome. Zdoggmd I never miss (<http://zdoggmd.com>). I listen to Amal Mattu's podcast.

Scott: We should talk about that because it's a "behind-the-firewall" podcast.

Rob: Amal Mattu's podcast is called *EMCast* (<http://emedhome.com>). In many ways, I modeled ERCAST off of *EMCast*. Amal, I hope you don't feel like I'm ripping you off by making my name very similar to yours, but I think we have different enough identities that that's OK. Amal's podcast, which is outstanding, is an hour long. It's one that you pay to access, which is not the usual construct of a podcast. The general principle is that they're free. You get *EMCast* as part of a subscription to emedhome.com. It's good enough that people do pay for it.

Scott: I will say that Amal is not charging for his podcast, but his podcast is behind a membership with EMedHome. As you say, EMedHome is a fantastic site, so you get a lot for your money, but it's not going to be as widely available as podcasts that are free. That's really the balance that most of us have to deal with. Most medical podcasts are available free of charge.

I listen to all the ones you've mentioned. There are a few more that have just hit the scene. There's the emergency ultrasound podcast, which I'm loving (<http://www.ultrasoundpodcast.com>). These guys are hysterical. They visited me in New York City a couple weeks ago and they're great guys. They're filling a niche. Right out of your neck of the woods, A Gobbet o' Pus with Mark Crislip (<http://moremark.squarespace.com/>). He is an ID doc, but in his soul, I believe he's an emergency physician, because I can relate to his entire take on medicine. He is the grandmaster. He's been doing it forever and has it down to a science. Something that I hope won't be a flash in the pan is Cliff Reid's *resus.me* podcast (<http://resus.me>). Cliff is another ED intensivist, but primarily an EMS physician from down under. There's been only one episode, and I hope Cliff is going to continue.

Rob: That podcast was a Herculean effort, and Cliff is just such a gem. I hope his podcast gets some legs.

Scott: That brings up another point we should mention. Cliff has a great voice. You have a great voice, Rob, and many people might be scared or put off if they don't. Can someone with a not-so-great voice do podcasting?

Rob: They absolutely can, and that's kind of you to say. You know what it takes? Microphone practice. Anybody's voice can sound professional with good cadence and tone. It just takes practice. I don't think anybody's voice, as far as most of us who fall under the bell curve, is particularly good or particularly bad. It's just how you use it.

Scott: I agree. I think anyone whose voice is not good for podcasting probably doesn't have a voice that's all that great for life. It's almost an impetus for them to start podcasting to get practice improving their voice timbre and tone; it would probably have fringe benefits all around.

Rob: Since my format is mostly interviews, I mainly listen to interview podcasts, just to see what techniques and interview styles people use. You know I love the WTF Podcast (www.wtfpod.com/). It's a bit X-rated. And also Fresh Air (www.npr.org/programs/fresh-air). I like that show quite a bit, but I know several people who don't.

Scott: I can't stand it.

Rob: I love it. I really like Terry Gross. You don't like that?

Scott: No, it drives me crazy. They're incredibly professional and a good example of quality podcasting, but I cannot stand it. I will say that NPR does put out some great podcasts, but my favorite nonmedical podcast has to be Radiolab (<http://radiolab.com>). Jad Abumrad of Radiolab just won a Genius Grant, so obviously other people are enjoying it as well.

Rob: How can we get one of those?

Scott: We should look into that. Maybe Mel Herbert can work that out for us.

Rob: Life in the Fast Lane deserves a mention here (<http://lifeinthefastlane.com>). It's not a podcast but a website devoted to emergency medicine education, podcasts, and blogs. They bring it all together, review it, and give summaries of what's happened in the past week. It's an incredible resource.

Scott: Mike Cadogan, Chris Nickson, and all the other Life-in-the-Fast-Lane authors are my heroes. If you had to ask me my favorite emergency medicine website, that's the one.

Rob: One other podcast that I like is EMRAP Educators' Podcast (www.emrapee.com/). Rob Rogers' baby.

Scott: Well done, well done. Could you wipe that stuff off your nose, Rob? I'm not sure how that got there.

Rob: Is he still doing that show?

Scott: I don't know. I haven't heard it in a while. I did listen every time a new episode came out—in the past that is.

Rob: Yeah, good old Rob Rogers.

Scott: Yes, Rob Rogers. I haven't thought of him for a while.
Grumble, grumble, podcast chapter.

Rob: I don't know if this is exactly a podcast, but I will say that this is where I get the majority of my CME, which is EM:RAP (<http://emrap.org>). We do have something to disclose about that.

Scott: We both work for EM:RAP. Mel Herbert, after we started our podcasts, recruited both of us. Mel looks for talent, and then sometimes he gets guys like us.

EM:RAP is an incredibly high-quality product. Mel keeps walking that balance between the information you need, versus too much academics, and manages to keep it real for the pit doc.

Summary

Rob: There you have it. Medical podcasting in a nutshell. If you want to start your own podcast, start by asking yourself why you're doing it. If you still want to proceed, figure out how frequently you want to publish. Use the podcasts you already listen to as guide for production cycle as well as format, length, and style. But of course, putting your own flair on the finished product is part of the reason for podcasting in the first place.

An important thing to remember when listening to medical podcasts is that you're not listening to peer-reviewed material. It's someone's opinion. Even though it may sound like it's all evidence based, it's still an opinion. A true evidence-based podcast on a single topic would be 6 hours long and boring beyond belief.

Further reading

Scott: For more on getting started with podcasting, I recommend these books—*Podcasting for Dummies* and *Podcast Solutions: The Complete Guide to Podcasting* by Michael Geoghegan and the podcast School of Podcasting (<http://schoolofpodcasting.com>).

CHAPTER 13

Use of simulation in emergency department education

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History of simulation in education

Simulation-based medical education (SBME) has been around since at least 17th century France, where birthing mannequins were used [1]. Despite the long-standing awareness of the usefulness of simulation for educational purposes, it has only recently been incorporated into medical school and residency programs. One reason for its greater use is that changes in our health care system have shortened hospital stays and brought sicker patients into the hospital, leaving fewer opportunities for learners to gain hands-on experience. In addition, these changes have given clinical educators less time to teach in clinical settings. Advances in technology and treatments have led to a greater need for skill acquisition and practice in medicine, accompanied by a focus on patient safety and reduction of medical errors [2].

Simulation research in the field of medicine has spanned four decades. Many research studies have looked at various aspects of simulation in education, and at least one set of authors has identified the “best practices” of SBME [1]. A total of 12 best practices have been identified:

- feedback
- deliberate practice
- curriculum integration
- outcome measurement

- simulation fidelity
- skill acquisition and maintenance
- mastery learning
- transfer to practice
- team training
- high-stakes testing
- instructor training
- educational and professional context.

This chapter focuses on a few of these best practices, namely, feedback/debriefing, deliberate practice, outcome measurement, simulation fidelity, and skill acquisition and maintenance.

Why use simulation?

Simulation benefits learners. Today's learners have had wide exposure to communication technology through high-speed computers, the Internet, and smartphones. Given this exposure and the learners' expertise in its use, they are receptive and generally excited about educational experiences involving simulated situations because they offer a more active process and employ state-of-the-art technology.

Studies indicate that simulation improves learning [3, 4]. Simulation is especially effective in developing skills in procedures that require eye–hand coordination and ambidextrous maneuvers, such as laparoscopy and the use of fiber-optic airway scopes. Simulation training prepares learners to deal with unforeseen medical events, improves teamwork and communication skills, and increases confidence and performance.

Simulation benefits educators. At present, medical education focuses on outcome and competency. A growing body of research suggests that a combination of evaluation methods is necessary to properly assess the complex skills that constitute the practice of medicine [5–7]. Testing students with oral and written examinations may demonstrate knowledge acquisition, but testing with simulation shows that a student knows how to care for patients [8]. Simulation has the advantage of being able to assess measures, such as teamwork and professionalism, that are otherwise difficult to evaluate.

Simulation benefits hospitals. Medical institutions have enacted safe medical practices at all levels within their systems, and professional organizations have endorsed simulation-based training [9, 10]. SBME helps achieve these mandates. Procedural training using simulation decreases infection rates; increases students' competence measured, as measured in the learning laboratory and during patient care delivery; and improves patient outcomes, as measured quantitatively [11, 12].

Simulation engages learners in a real-time and interactive format that provides opportunity for unlimited practice and allows mistakes to be made without harming an actual patient. This idea of deliberate practice, which originated from psychologist K. Anders Ericsson, is well known and studied [13–17]. Deliberate practice is demanding for learners, and it is an important principle of SBME. When used for medical education, it has the following requirements [18]:

- 1 highly motivated learners with good concentration (e.g., medical trainees);
- 2 engagement with a well-defined learning objective or task;
- 3 appropriate level of difficulty;
- 4 focused, repetitive practice;
- 5 rigorous, precise measurements;
- 6 informative feedback from educational sources (e.g., simulators, teachers);
- 7 monitoring trainees' learning experiences, correcting errors, and engaging them in more deliberate practice;
- 8 evaluation to reach a mastery standard;
- 9 advancement to another task or unit.

Basic simulation tools

Mannequins

Mannequins come in various shapes and sizes and can serve different purposes, including replication of the birthing process and imitation of an infant in distress secondary to congenital heart disease. *Fidelity* describes the extent to which the appearance and behavior of the mannequin imitate the appearance and behavior of an actual patient [19, 20].

The particular skills or learning objectives that are being taught dictate the type of simulator and level of fidelity that are necessary for a particular scenario. If the learning objective is to emphasize the timing and depth of chest compressions in a resuscitation scenario in an adult, a low-fidelity mannequin such as Resusci Anne® (Laerdal, Stavanger, Norway) can be used. This mannequin has limited responsiveness to learners' interventions (i.e., it cannot demonstrate a return of spontaneous circulation if chest compressions are applied appropriately). If the objective is to have learners recognize when an arrhythmia becomes a cardiac arrest through loss of the pulse, then a higher-fidelity mannequin should be used. An example is SimMan® (Laerdal, Stavanger, Norway), a computer-driven mannequin that can simulate physical signs of cardiopulmonary management and provide feedback for learner interventions (e.g., produces tactile pulses).

Computer-based simulators

Screen-based simulation allows learners to participate in decision-making scenarios at their own pace, without an instructor. These commercially available programs cover a wide range of topics, from basic science to trauma and bioterrorism.

Patient-actors (standardized patients)

They are trained individuals who are paid to participate in medical scenarios. They can contribute to the evaluation of the student's history taking, understanding of the physical examination, and interpersonal and communication skills. The Association of Standardized Patient Educators holds annual conferences and promotes research and standards.

Part task trainers

These 3D devices simulate a specific task and give varying levels of feedback to the learner. For example, venipuncture arms, lumbar puncture trainers, and urinary catheterization devices may have only a sense of tactile feedback, whereas laparoscopy or endoscopy devices have computerized feedback incorporating haptic technology (touch and pressure) so that learners can learn eye-hand coordination as well as obtain the feel of the procedure.

How to set up a simulation program

The educational needs of your learners should be the primary consideration when creating a simulation curriculum. What do you want to teach? Do you need to use simulation for the acquisition of cognitive skills, technical skills, and interpersonal and communication skills, or perhaps all three? Determining your educational objectives is the single most important step toward identifying the resources that are needed to create a simulation program for your learners.

If your educational objectives are primarily cognitive, then problem-based or case-based learning can be an extremely effective way to teach. However, for the teaching of higher-order cognitive skills, such as critical assessment and management, a low- or high-fidelity human patient simulator (HPS) will be better able to meet your learning objectives [21]. The type and fidelity of mannequin should be based on the resources available and on the clinical case scenario being presented. For example, a child-sized mannequin would be most appropriate in a scenario calling for the resuscitation of a child.

When developing a case scenario to teach cognitive skills, it is important to consider the skill level of your learners. For example,

novice learners should be able to manage a case scenario that simulates a straightforward asthma exacerbation, whereas advanced learners should be able to treat an asthma exacerbation with respiratory failure, requiring intubation and subsequent ventilator management. The amount of time to be allotted to the case scenario should be predetermined so that all learning objectives can be covered in the allotted time. Learners will not always react to the simulation in a predicted way, so cues should be offered throughout the scenario to ensure that it is progressing as designed. Cues can come from the HPS, actors, or the preceptor.

You can write case scenarios to address your specific learning objective, or you can search one of the online simulation libraries for published simulation cases that fit your needs. Two such online libraries are the Simulation Case Library of the Society for Academic Emergency Medicine (www.emedu.org/simlibrary) and MedEdPORTAL from the American Academy of Emergency Medicine (www.aamc.org/mededportal).

After your learners have completed the case scenario, a debriefing session should take place. During this time, learners have the opportunity to discuss their actions during the simulation and the outcomes that resulted from those actions. Debriefing is discussed later in detail.

If your learning objectives involve the acquisition of a technical skill, such as central line placement or chest tube thoracostomy, a task trainer, cadaver, animal model, or HPS could be used. However, certain procedures, such as vaginal delivery of an infant with a nuchal cord, are difficult to simulate on animal models or cadavers and are easier to simulate using high-fidelity HPS. The use of more than one type of model may actually be beneficial. Brydges and colleagues [22] suggested that for the transfer of clinical skills, progressing through several simulation models with progressively higher levels of fidelity is superior to a single simulation modality.

Before the hands-on training begins, a didactic session is usually conducted, detailing the basic steps of the procedure being taught and providing information about its clinical indications and contraindications. This information can be conveyed through a lecture, a video, or an online presentation. This advanced training increases the learner's confidence in technical skills such as airway management and securing vascular access [23].

To teach interpersonal and communication skills, you may simply need a case scenario in which learners interact with each other, or a standardized patient can interact with the learners. Virtual patient programs have been implemented successfully for this type of skill acquisition [24].

An actor can represent a patient, consultant, or family member. The role may be played in person, or the actor can provide the voice for a phone consultant or an HPS. Case scenarios that are designed to teach interpersonal and communication skills are designed in much the same way as a scenario that is designed to teach cognitive skills, but the emphasis is on personal interactions rather than on the acquisition and application of medical knowledge. During the debriefing session, learners should be encouraged to reflect on their personal interactions.

Your educational objectives might require the acquisition of more than one skill. In these cases, you may need to use multiple types of resources for one scenario. For example, if your educational objectives include demonstrating the ability to obtain informed consent for placement of a central line (demonstrating interpersonal and communication skills) and inserting that line correctly (demonstrating a technical skill), you may need to write an actor in the script for the informed consent part and use a task trainer for the central line placement part.

Debriefing

Feedback has been cited as the most important variable in simulation for fostering effective learning [25]. There are two broad types of feedback: formative and summative. Generally, debriefing takes the form of formative feedback because we want to improve performance rather than evaluate the learner's actions as pass or fail (summative).

Rudolph *et al.* [26] designed a succinct four-step model for effective debriefing.

- 1 Note salient performance gaps related to predetermined objectives.
- 2 Provide feedback that describes the gap.
- 3 Investigate the basis for the gap by exploring the frames and emotions contributing to the current performance level.
- 4 Close the performance gap through discussion or targeted instruction about principles and skills relevant to performance.

It is important to educate instructors on how to debrief learners. Instructors should set a tone of respect and allow time for self-correction by guiding learners through a review of the case. Instructors should realize that students are not inherent “mistake makers” and should build an environment in which mistakes are viewed as opportunities for learning [27].

Assessment

SBME can be used to evaluate many elements of competency. One of the advantages of simulators in testing purposes is their generally high

degree of reliability—because of their programming, simulators consistently present problems in the same manner for every learner and minimize the variability inherent in actual clinical encounters [28].

Patient care actions can be evaluated in terms of time to action [29]. For instance, time to intubation in a patient with signs of respiratory distress is a data point that can be easily recorded to help objectively evaluate learners.

Procedural skills can be assessed while giving the learner time to practice without concern about harming a patient. Checklists can be used to document the performance of procedures, making sure the learner goes through all essential actions. Checklists are also ideal for assessing medical knowledge (e.g., ordering the correct medications for rapid sequence intubation) as well as other competencies such as teamwork and professionalism. A guided list provides an organized and efficient way to review critical situations with multiple members of a team. Some training programs have created scripted scenarios. Learners can be filmed so that their actions and communication skills can be assessed later [30].

Challenges to simulation

Simulators are expensive compared with lecture-based education. The financial aspects of medical simulation are important considerations when starting or maintaining a program. It is important to include line items in the budget for maintenance costs and the purchase of new products. Medical technology changes rapidly, so the simulators you purchase today probably will be obsolete in 5 or 10 years. A reliable source of financial support is essential for keeping up with technologic advances in a sustained simulation program.

SBME may require a greater number of educator hours than traditional medical education. For a simple problem-based learning scenario, one instructor may be sufficient. However, case-based scenarios with a high-fidelity HPS require multiple instructors: one to operate the mannequin, another to observe the learners, and yet another to lead the debriefing following the scenario. Finding educators to create and teach material outside the more familiar lecture-based format can be difficult but is critically important to the success of an SBME program. Demonstrating the process to potential instructors before asking them to provide instruction for or translate their instruction into a simulation-based learning session is usually helpful. Thus, engaging faculty members early in the program captures and maintains their interest in teaching material.

SBME typically requires more physical space than a lecture. If your case scenario takes place in an emergency department, ideally,

the simulation would be performed in a mocked-up or an actual emergency room. However, finding clinical space to perform these scenarios can be difficult because emergency departments usually do not have rooms available for non-patient-care activities. Many institutions have simulation centers with rooms made to look like patient rooms (e.g., emergency room, intensive care unit, operating room). If your institution has made an investment in SBME, space has probably been allocated for the training sessions. Some simulation programs use whatever space is available and then adapt the environment as space and funds become available.

Conclusion

Many institutions have created simulation centers for the purpose of educating medical students and residents, as well as ancillary staff and faculty. If you work at such institutions, you are likely already involved in some type of SBME or can easily become involved. If you work at an institution that has yet to adopt SBME, you can develop a simulation program by acquiring a select number of resources and developing a specific curriculum. Once you have mastered the basic uses of simulation that are discussed in the chapter, you can consider using simulation for more complex teaching tasks such as interdisciplinary education with paramedics, nurses, and other medical specialists and for conducting disaster drills. Further research is necessary to elucidate the additional benefits of SBME, which is becoming standard in medical training and the culture of medical education.

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Suggested websites

Many types of commercially available simulators are listed at www.pennstatehershey.org/Jweb/simulation/home/available. Academic publications related to medical simulation are listed at www.harvardmedsim.org/center-for-medical-simulation-resources.php.

SECTION 3

Teaching Specific Groups

CHAPTER 14

Teaching medical students

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Teaching is more than imparting knowledge, it is inspiring change.

Learning is more than absorbing facts, it is acquiring understanding.

—WILLIAM ARTHUR WARD

Reasons to teach medical students

All physicians-in-training were once medical students. As educators, we have a unique opportunity to influence not only medical students' specialty selection but also their view of our specialty (Table 14.1). Students choose a specialty based on their interactions with faculty, what they observe while on rotation, and their perception of the specialty. We can affect these facets and attract the best students to our own specialty by being professional and clinically competent role models. We can also teach students what our specialty provides within the entire realm of care for the patient. In the same light, all physicians who enter other specialties also start as medical students. Therefore, we have a tremendous opportunity to impart the abilities and limitations of our specialty to these students. In this manner, we can challenge their preconceived notions about our specialty and promote collaboration between specialties for the benefit of patients.

The medical student's opinion of you and how you handle patients will enhance their rapport with emergency physicians when they become physicians. If they are treated with respect, given responsibility, and taught while on service, their opinion of our specialty may be more favorable. One of the most compelling reasons to teach medical students may be that you or your family will one day need the services of one of these medical students who become specialists.

Table 14.1 Why teach students.

To encourage bright and motivated students to choose EM—students' career decisions are at least partially based on interactions with faculty in their specialty of choice
To promote future collaborations with colleagues in other services
To explain what EM provides to the medical community
To ensure that competent, compassionate people are moving into the specialty of EM

Should you not help them acquire the desire, skills, and knowledge to be the best doctors they can be?

From the emergency medicine (EM) standpoint, it should be made clear to medical students that no matter what specialty they enter, they will interact with emergency physicians on behalf of their patients and probably their friends or family members. Therefore, they need to know process issues, such as the fact that patients are seen based on their acuity. All patients who come to the emergency department (ED) will be seen, no matter the hour, insurance status, or degree of illness, but some will have to wait. Students should learn that because of patient volume and the inability to close our doors when the ED is full, we have a limited amount of time to spend with each patient. We are sometimes forced to make decisions about care without the luxury of knowing a thorough patient history or having all requested test results in hand. Regardless, students should understand that every patient will be well cared for in the ED.

Unique educational experiences during an emergency medicine rotation

Patients usually come to an ED because of a new illness or condition or an exacerbation of a chronic illness; therefore, students will learn the approach to a patient with an undifferentiated complaint (Table 14.2). On many services, the admitted patient has already been diagnosed and treatment has been started by the admitting physician or a physician in a clinic or ED. The student in the ED will learn to develop a list of differential diagnoses. Although students are expected to develop differentials on every service, the ED sees patients spanning all services, so the differential cannot be limited to a specific specialty's area of expertise.

On the wards, students are often expected to gather an all-encompassing history, conduct a physical examination, and then describe the treatment for all the identified problems. In the ED,

Table 14.2 Unique educational experiences in EM.

Approach to a patient with an undifferentiated complaint
Directed history and physical
More independent care for patients
Various diseases in one shift
Expectation to perform procedures
Presence of varied and multiple supervisors

students are expected to perform a focused complaint-oriented history and physical examination to identify a complaint-specific differential diagnosis and management plan. Because the evaluation and subsequent presentation occur rapidly (often in <30 min), students have minimal time to consult a textbook or obtain directions from a resident physician.

On the wards, most patients have been stabilized, and for those who are not, the students are never really independently in charge of the care. But in the ED, we often allow students to provide supervised care to potentially sick patients, not only just from the standpoint of the vital signs but also in terms of time-sensitive issues such as myocardial infarctions and strokes. The patient may arrive unstable without a diagnosis or become unstable in the course of care. As an ED physician is in close proximity, we often allow students to continue to provide the primary care for such patients.

In other services, the student can expect to see patients and complaints specific to that service. For example, on an orthopedics rotation, students see fractures and musculoskeletal injuries, and on a cardiology rotation, they see diseases germane to the heart. From the medical student's point of view, they can concentrate on a relatively smaller realm of information. In the ED, on one shift, the student may see a patient with chest pain, then a patient with a fracture, and then a newborn with fever. This aspect of not knowing what you will see next is part of the thrill of being an EM physician, but it is unnerving to many students.

During their third year, students are expected to perform procedures to which they might have had only limited exposure. We might assume that the student learned suturing on surgery and obstetrics rotations, but in reality, he or she was given only the *opportunity* to learn. Many students avoid procedures even when given the perfect opportunity to learn and practice them. In the ED, we assign them the task, not ask if they would like to try.

On the wards, students usually work with the same physicians for 4, 6, or 8 weeks. They learn the quirks of their supervisors and

nuances of what to say or do on rounds to stay out of trouble. In the ED, they have limited continuity with a single attending/resident, and each attending/resident has different expectations of the student regarding the care of a specific disease.

Clerkships are often a mandatory rotation, so many students are not there by choice. Some of them take this time to improve their knowledge base, see things they will never get a chance to see again based on their specialty choice, or learn how to take care of medical and surgical emergencies. Taking the time to know the student's specialty choice and helping them see the most relevant patients and diseases that they will one day care for may be the starting point for a long-lasting rapport.

Qualities of an effective teacher

As this topic is covered in many other sections of this chapter, I offer only a few relevant points here (Table 14.3). Students respond better if you treat them with respect. Acknowledge their presence. Know their name and what specialty they have chosen. Engage them in conversation about something other than the patient.

Maintain professional behavior. Using derogatory language with a patient, a nurse, or other service providers is inappropriate and will diminish the student's regard for you and your specialty. Disrespectful treatment of staff or patients will do the same. One of the hurdles of EM is overcoming the often incorrect perceptions that other services have of us. Treating other service providers with disrespect in front of students or other staff damages our credibility and makes overcoming this hurdle even more daunting. Model the behavior you want them to emulate. Actions speak louder than words. Contradicting your words with opposing actions makes you an unreliable hypocrite and therefore unworthy of trust.

Show clinical competence in your field. Many students have already been taught a certain approach to a disease, and when we alter that approach, confusion can result regarding whom to follow. Take the time to show the student the literature that supports your practice, explain why your approach varies from what he or she was taught

Table 14.3 Qualities of an effective teacher.

- Maintains professional behavior
- Shows clinical competence
- Teaches with enthusiasm
- Is open and approachable

or what the consultant expected, and acknowledge that there is often more than one way to treat a disease.

Teach with enthusiasm because it is infectious. Anger, cynicism, rudeness, and disrespectful behavior breed the same in your student, and that disrespectful behavior might be directed at you one day. Your teaching ability has a positive and significant effect on the student's learning [1].

Be open and approachable. Do not be condescending or overbearing. If students do not feel comfortable asking a question or being wrong with a plan or differential, they will avoid you or become reluctant to move forward in their knowledge and skills. This stunts your ability to teach and their desire to learn.

Adult learner themes

A good teacher should remember several things about adult learners. They are independent thinkers who have already developed their opinions, ways of learning, and ideas about effective teaching. Teaching students should include the educational themes discussed in this section (Table 14.4).

Adult learners come from varied backgrounds. They have had different personal and medical experiences. Depending on when they enter your rotation, they have completed different third- and fourth-year rotations. Depending on their desired field of medicine, they have put more effort into learning the topics and skills they think will benefit them most.

Determine the student's level of ability and knowledge base before you start to teach. Each student has a different level of knowledge and experience. Ask probing questions, in an unassuming manner, to see where their knowledge base ends so that you know where to start teaching. Otherwise, you might deliver a great talk on kidney

Table 14.4 Adult learner themes.

- Adult learners come from varied backgrounds
- Determine student's level of ability and knowledge before starting to teach
- Nurture an intrinsic rather than extrinsic motivation to learn
- Aim for a higher level of cognition than just accumulation of fact
- Deliver information as concise but generalizable rules
- Let the learner know that teaching is about to occur
- Difficult topics or skills take time and need to be repeated to learn
- It is acceptable for the learner or the teacher to not know something
- Welcome questions
- A student who disagrees with a teacher is not necessarily a difficult learner

stones to someone who just finished urology. It may still be a great presentation but it may not be needed or appreciated by the student. Knowing their abilities allows you to give students a little more (or less) independence in their clinical decision making. Finding gaps in their knowledge base allows you to identify areas for self-directed learning, such as having them look up Well's criteria in the diagnosis of pulmonary embolism.

Developing a student's intrinsic motivation to learn is better than imposing an extrinsic motivation. Motivating a student by showing that an improved knowledge base makes you quicker (because you do not have to look it up), allows you to ask the right questions (because you know what points are important in the history), and maintains the respect of the patient (because you did not have to consult with another physician) helps them know what skills they should aspire to master to become a talented physician. This motivation will apply throughout their entire career. In contrast, external motivation, such as telling students they need to learn something because it will be on the upcoming test, can be short lived. Once the test is over, do they really need to still know it?

Aim for a higher level of cognition than just the accumulation of facts. Knowing to use β -blockers as the first-line therapeutic agent for aortic dissection is an example of fact accumulation. Knowing that the reason to use a β -blocker first is to decrease the shearing force and not just the blood pressure allows students to apply that thought process to other diseases. Then they know why nitroprusside, an effective blood pressure control drug, is not used first or alone.

Information should be filtered into a structured format for use in future clinical scenarios; this can be done by teaching a concise but generalizable rule [2]. The statement that young adults with back pain do not usually need radiographic evaluation is true. Knowing that red flags indicating the need for radiographic evaluation include cancer, fever, trauma, previous surgery, neurologic deficits, and intravenous drug abuse allows the student to apply that knowledge to a wider range of patients.

Let them know when teaching will occur. Many students do not recognize it unless it is labeled or PowerPoint slides are on a screen. Start teaching points with transitions such as "A quick teaching point from this case is ..." or "Let's see what we learned from that encounter ..."

Comprehending difficult topics and acquiring complex skills take time and repetitive exposure to retain knowledge and understand how it applies. Therefore, for multifaceted cases, such as the treatment of a patient with acute coronary syndrome (ACS), recognize that the student requires repetition of the whole process to reinforce learning.

A student cannot grasp the care for ACS, from aspirin to heparin to Plavix to glycoprotein IIb/IIIa inhibitors as well as β -blockers, during the first encounter with a patient with this condition. Understanding will be gained over repeated exposure to patients with ACS as the student learns another portion of the treatment algorithm each time and the already learned portions are reinforced.

It is acceptable not to know something, but it is not acceptable to be content to not know it. Admit when you do not know something and make a collaborative effort to find the answer. In medical education, we often punish those who do not know something. The punishment can be direct, through condescending commentary, or it may be indirect, by causing embarrassment by moving a discussion away from a student who does not know an answer to another person who knows the answer. Fear of not knowing makes students avoid the challenge of a new disease encounter. They stick to what they know, so they will look intelligent and skilled in your eyes.

Welcome questions. Reframe them if necessary to help the student understand the concept they are addressing. Allow students to get to the proper conclusion using their own thought process and pattern as long as it is logical and arrives at the appropriate end point. There are many different ways to look at a picture, and each of us assimilates it in a different way. As long as we are assimilating the same picture, different routes give you another way to assess the next clinical picture. This process takes time and you must listen.

When adult learners disagree, or do not immediately agree, it is often because what the teacher has just said does not match what they have been told, seen, or experienced. Sometimes students who are labeled as difficult are really very smart and learn differently. Learn their take on the matter and then look into the discrepancy.

Educational curricular components

Any clerkship should structure the educational experience around a set curriculum based on obtainable and defined learning objectives (Table 14.5) [3]. The clerkship should provide a learning environment to increase the student's knowledge as well as an opportunity to gain clinical experience and skills [4]. For EM, published curricula for third- and fourth-year rotations as well as an educator's handbook are available [5–8]. A primer is available to medical students to help prepare them for their time in the ED [9].

The students and the educators should know the expectations of the rotation, especially during clinical time. The clerkship director should align his or her expectations with those of the medical school and the Liaison Committee on Medical Education (LCME). Educators

Table 14.5 Educational curricular components of teaching.

Educational objectives should follow a standardized curriculum
Expectations of the clerkship should be explained and followed by students and teachers
Prepare for your lecture; misinformation is hard to correct
Teach and evaluate procedural skills for students, instead of just expecting that they know how to do it
Evaluate the student's ability to collect medical history and conduct physical examination
Feedback should be given in real time; it should also be accurate and devoid of emotion
Promote students' self-evaluation
Do not shirk the responsibility of evaluating students

should align their expectations with those of the clerkship directors or discuss the differences. Expecting students to adhere to two sets of expectations for their clinical shifts puts them into a double bind.

Part of the curriculum is in lecture format, often delivered as PowerPoint presentations. Devote ample time to your preparation for lectures to medical students. If you deliver incorrect information, students are put in the position of disagreeing with you or, worse yet, applying false information to patient care. If the error is left unchecked long enough, it will take precious energy, time, and friction with other health care professionals to reverse it. Do you not believe me? Think about the issue of giving narcotics to a patient with a surgical abdomen and how long it has taken to even start to reverse that medical myth.

The EM curriculum undoubtedly has a procedural component. Be certain to know what knowledge level your students should have and have actually achieved. Students often say they have never been shown how to do something, such as how to suture, even if they just attended a surgery rotation. It saves them the embarrassment of having to say that they hid from that exposure. Remind them that they should learn as much as they can on each rotation, not just check a box and complete the least that is required of them. Students also like to say they can do something, but do you make them show you? Even something as simple as administering oxygen to a patient gives you a chance to teach.

Although we often want to move directly to the differential and evaluation plan, do not expect that students are competent in their history taking and physical examination skills. They learned these skills in the first 2 years of medical school, when they did not really use them often and nobody had taken the time to watch and reteach them. Therefore, we should demonstrate and evaluate both history taking and physical examination skills.

Feedback is crucial to effective teaching and is reviewed in greater detail in Chapter 7. If you do not provide feedback, you are, in essence, reinforcing the student's behavior. Therefore, give specific feedback in real time. Depersonalize the issue; state only facts and explain why the behavior or deficit will cause a problem. Specifically identify areas of strengths that you want the student to continue and areas of weaknesses that he or she can work on. These are easy to identify when you allow *students* to work on a presentation, a list of differential diagnoses, and an evaluation plan. Students quickly learn that if they stall for a mere few seconds, most faculty will step in and take over the differential and evaluation/treatment plans.

Promote students' self-evaluation by encouraging them to reflect on how they performed during the shift. Students are often harder on themselves than you will ever be. If they identify a problem that you agree with, their self-awareness followed by your acknowledgment and plan for correction will lead to a stronger desire for change and monitoring of the behavior [10]. If a knowledge deficit is identified, the student will have the desire to fill the void and not just answer the isolated question.

Evaluation of the student will be part of your educational responsibilities and is required in all clerkships. It is imperative that teachers take the time to learn the objective criteria for the different areas of evaluation and abide by them. Not evaluating a student robs the student and the clerkship director of the chance to learn from, or act on, your impressions. Giving inflated grades so that you do not have to defend your scoring only allows incompetent students to become incompetent doctors. Always remember that bias creeps into our evaluations as well. Being cute, nice, polite, respectful, attentive, funny, affable, or gregarious does not make students competent. It just makes them more desirable to have around. Do not let that stop you from objectively evaluating their skills.

Clinical teaching

Providing a structure for the administrative aspects of a rotation allows students to adapt quickly to the new environment with less anxiety and stress (Table 14.6) [11, 12]. This allows them to learn more and ask more clinically oriented questions. Guide students in their selection of patients to help them stay within the limits of their ability. Allow them sufficient, not excessive, time to complete a directed history and physical examination. Give them time to review the records and develop their presentation. When the clinical situation does not afford the student this time, explain that you are going to guide the case quickly because of the status of the department or the patient.

Table 14.6 Pearls for effective clinical teaching.

- Allow students time to prepare for their presentation of a case
- Be attentive and free from distractions to listen to their presentation
- Expect them to develop a list of differential diagnoses
- Expect them to develop and defend an evaluation/treatment plan
- Think out loud on complicated issues
- Debrief with feedback after a clinical encounter
- Teaching is a fluid process—take advantage of every opportunity
- Learn a multitude of ways to teach at the bedside
- Allow others to teach without interrupting

Understand that the presentation of the case is the primary focus of the student–faculty interaction. This is the student’s time to shine, and his or her level of anticipation/anxiety will match the faculty’s expectation and confidence. Because presentations in the ED are concise and directed, inform the student of what you expect from him or her during the presentation. The best solution would be for all faculty members to agree on a single format and then present this format to students during orientation to the rotation. When the student presents a case to you, allow him or her to finish without interruption.

If you have no expectations of the students, they will meet them easily and often do no more. Therefore, expect students to develop a list of differential diagnoses. This list should include common diseases as well as those that cannot be missed without significant morbidity or a chance of mortality to the patient. Expect them to use the history and physical to remove, retain, and order various diagnoses on the differential. Ask them to defend this final list, as it will give you an insight into their thought process as well as identify their level of knowledge on the subject. This allows you to know what to teach and what to encourage them to read.

Expect students to generate an evaluation plan for the patient, which includes why they are recommending a specific test (laboratory test, radiograph, physical examination) and what they will do with the results. Stepping over them and telling them what to order may allow you to move the patient along faster, but it does not allow you to assess their knowledge base or correct any misconceptions, such as ruling out infection because of a normal white blood cell count.

Think out loud. We make connections and decisions considering multiple items of history, physical, knowledge, and process, but we just state the conclusion and expect that students follow the process.

Debrief a student at the end of a clinical interaction so that you can address his or her performance and agree on his or her knowledge level, clinical competence, and interpretation of the history, physical, and clinical data [13]. Further feedback will follow after more clinical encounters, but directed discussion at the end of a single encounter allows reinforcement of clinical findings, rules, and thought processes. The clinical experience gives the student a framework to guide further reading and learning. The student will more quickly remember information associated with a clinical scenario than that from unattached reading.

Be prepared to teach when the moment arises. Teaching in the clinical arena is a fluid process. Remain committed to teaching, even if it is only in 30-s blocks of time at the end of a case. Take advantage of “teachable moments” and specifically inform learners that you are teaching them something. Faculty who practice only one standard way of teaching will limit their opportunities to teach. Instead, learn multiple ways of teaching at the bedside (discussed in Chapter 5), including the microskills model (Chapter 24), the 1-min observation, learner-centered precepting, and modeling problem solving [14].

Having a variety of teaching skills and the desire to teach enables the faculty member to identify many teaching opportunities and adapt the teaching to the clinical environment. Some days allow longer and more in-depth discussions. Some busy shifts and more difficult patients lend themselves to modeling the thought process and patient interaction skills. Remember that you do not have to teach after each patient encounter or during each student interaction; your time, ability, and mood may not allow for it. In addition, the student’s level of knowledge and ability may not require additional teaching, but just feedback on a job well done.

Allow others to teach. If they did a good job congratulate them and move on. Reiterating a clearly presented argument wastes time and undermines the ability of the original teacher. If you reward teachers’ ability, they will do more of it. If you take over, they will stop. If you show confidence in them, students will respect them. The student will then have two trusted teachers and two sources of information. It is not about you; it is about giving the student as many educational resources as possible.

Techniques for overwhelmed students

Orientation is important to the student’s ability to adapt to the new environment and lays the groundwork for the parameters of what

they will be allowed to do [15]. Setting a limit of three active patients at any one time takes pressure off the students and stops the eager student from picking up every patient in the department.

Structure the learning experience so that students know how to attend to the administrative details of the department, such as how to document charts, how to use computers and programs, and how to order laboratory tests and radiographs. Describe the ED approach to them so that they realize why we ask, “Sick or Not Sick?” and why they should get the supervising physician immediately for the sick patients. Explain the need for resuscitation before the evaluation is completed. The ability to make decisions with limited information is the cornerstone of a good EM physician but is well beyond the ability or experience of an average medical student. Again, guide students in their selection of patients to help them stay within the limits of their ability and your desired level of input.

Reassure students that they will not be alone in the care for the patient. Inform the overly confident student that you will be providing close oversight and that all management decisions should be cleared with you before implementation. Provide timid students with the safety net that if they let something fall between the cracks, you will be there to catch it. Remind them that their priority is learning, which is accomplished by reading on a topic or seeing an interesting finding in a patient.

Tell stories of how difficult it was for you during your medical school rotations, and how now it makes sense what they were trying to teach you. Seeing you as struggling then but capable now lets them know there truly is a growth period. You became experienced as a result of all the near misses and mistakes you made.

Believe in them. Believe they have the ability and desire to acquire knowledge, skills, and attitude. Reward behaviors that show initiative and independent thinking.

By introducing students to interesting patients and findings (electrocardiographic, radiographic, and physical examinations) in the ED, you allow them to view various diseases without taking specific patient care responsibilities. You get a breather; they gain knowledge. It also increases the chance that they will see patients with less common disorders or presentations.

Give students small educational assignments so that they will take ownership of their education. Teaching them introspection and encouraging their desire to fill the gap will give them the tools they need to stay on top of medical knowledge and skills.

Summary points

- 1 Expect students to develop a differential and treatment plan.
- 2 Assess their level of knowledge to know where to start your teaching.
- 3 Be attentive and free of distractions during their presentation.
- 4 Do not tell students the diagnosis or what to order for unless you explain your thought process out loud so they can see the steps you took to get there.
- 5 Teach concise general rules that can be used in future clinical scenarios.
- 6 Do not think you have to teach on every patient. Each day is different, depending on you, the student, and the clinical scenario.
- 7 Promote learner autonomy by letting students perform self-evaluation. Points they identify will be more vigorously corrected than those you identify.
- 8 Teach students pearls that are clinically relevant instead of those that are germane only to trivia buffs and written tests.
- 9 Help the student develop an intrinsic rather than extrinsic motivation to learn.
- 10 Aim for a higher level of cognition than just accumulation of facts.

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CHAPTER 15

Teaching residents from other services in the emergency department

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Introduction

Academic emergency departments (EDs) are staffed by both emergency medicine (EM) and non-EM residents. Under the auspices of the Accreditation Council for Graduate Medical Education (ACGME) in USA, the Residency Review Committees (RRCs) of six medical specialties require clinical exposure to EM for their postgraduate residents, and another eight recommend it [1]. The ED provides unique clinical experiences and learning opportunities relevant to various postgraduate training programs [2].

Off-service residents (OSRs) usually rotate for 2–12 weeks in the ED during the course of their training. They learn principles of immediate assessment of undifferentiated patients, diagnostic planning, prioritization, and urgent intervention. These important skills are often immediately applicable in managing patients with acute medical complaints in their specialty. The ED also exposes OSRs to unique areas of medicine, including toxicologic and environmental emergencies, acute airway management, resuscitation, and trauma.

Advantages of having off-service residents in the emergency department

OSRs not only gain a unique set of skills and knowledge from rotating in the ED but also contribute significantly to the productivity of academic EDs. They provide an extra corps of care providers, which is especially useful on EM conference days, when all EM residents are excused from weekly clinical duties to attend didactic sessions. Under the supervision of board-certified emergency physicians, OSRs function almost as well as EM residents. In a study comparing ED quality indicators on conference days and nonconference days, there was no difference in the number of diagnostic tests, consultations, and unscheduled return visits or in patient satisfaction scores. The presence of OSRs was, however, associated with slightly longer decision-to-admit times (333 vs 313 min for EM residents) and ED lengths of stay for admitted patients (490 vs 445 min for EM residents) [3]. The presence of OSRs may reduce the number and/or duration of shifts for EM residents, relieving some of the burden of clinical service and potentially avoiding trainee fatigue and improving overall group morale. OSRs represent a unique learner population for senior EM residents and attending physicians to practice teaching skills.

Team building is yet another advantage of incorporating OSRs into the ED workflow. Although this concept may be less tangible than staffing numbers and shift hours, building an institutional sense of camaraderie between the EM staff and OSRs can have enduring positive effects. The process of consultation and admission to OSRs will be likely more efficient and collaborative if the OSR has rotated through the ED. OSRs will receive calls, not from strangers, but from friendly colleagues, whom they know, have worked with, and trust.

In the international setting, where many EM educational and EM systems are currently in the early stages of development, encouraging residents from other specialties to rotate and work in the ED offers many significant benefits. First, given the early stages of development of many EM systems abroad, there is simply no alternative workforce available to staff the ED, and OSRs are required to fill the schedule. In the newly growing ED, OSRs should be provided a valuable experience with a strong focus on learner-centered education. This helps to instill in them a new respect for the emerging specialty of EM. Second, training OSRs in an ED with direct faculty-level oversight and support, which they may never have experienced before in their parent specialties, reveals to them the intricacies of EM practice and patient-centered care. Finally, it helps to create lasting relationships and an understanding among the new EM faculty, the OSRs, and their parent specialist faculty members, who themselves may never have

been exposed to a fully functioning, EM faculty-staffed ED before. In this way, creating a rewarding rotation for OSRs can be seen as a developmental and political tool in EM systems development, in addition to a tool for solving workforce and educational issues.

Suggested educational goals

In a survey of the US allopathic EM residency programs, conducted by Branzetti *et al.* [1], EM residency educators indicated that the three most important didactic areas to teach OSRs are resuscitation, trauma, and toxicology [1]. In a survey of 71 internal medicine residents, conducted by Kessler *et al.* [4], the greatest self-perceived deficits in EM core knowledge were in orthopedics, environmental emergencies, airway management, and ophthalmology.

On the basis of such targeted needs assessment studies and supported by the Academic Affairs Committee of the American College of Emergency Physicians (ACEP), Kessler *et al.* [5] proposed a 4-week curriculum for rotating residents in the ED. This curriculum encompasses a list of competency-based clinical objectives (Table 15.1) along with the core didactic topics and procedural skill requirements (Table 15.2).

Models for teaching off-service residents

Instructional models for OSR education are discussed in the following sections.

Clinical (case-based) teaching

Clinical teaching is the primary modality used in the ED to teach all trainees while on shift. We define *clinical teaching* as the informal educational discourse between the teacher and the learner that follows each patient care scenario during an actual shift. With growing emphasis on competency-based outcomes for learning, clinical teaching provides the greatest opportunity to directly assess and improve learner competency. Teaching is tailored to each trainee's level of knowledge and is intended to be directly relevant to active patient care issues. Learners receive immediate, formative feedback regarding their specific strengths and weaknesses. The sheer quantity of potential "teachable moments" using the clinical teaching approach is a definite advantage. If an OSR sees about two patients per hour during a typical 8-h shift, he or she will have more than 15 patient care encounters, each of which has multiple teaching points to discuss. The wide spectrum of ED cases provides a wealth of potential clinical

Table 15.1 Educational objectives within the ACGME competency framework for US off-service residents, recommended by the Academic Affairs Committee of the American College of Emergency Physicians.

ACGME competency	Learning objective
Patient care	Complete a focused history taking and physical examination in the ED setting
	Initiate early treatment of true medical and surgical emergencies in critically ill patients to mitigate significant morbidity and/or mortality
	Manage multiple patients simultaneously
	Arrange a sound disposition and follow-up for patients being admitted to the hospital or discharged from the ED
Medical knowledge	Create a working differential diagnosis of the undifferentiated patient before formal presentation to the attending physician, which includes all potentially life-threatening conditions
	Differentiate between patients who warrant inpatient admission and those who can be discharged safely
Practice-based learning and improvement	Appropriately locate and use evidence-based medicine in the diagnosis and treatment of patients in the ED
	Use information technology, including laboratory and imaging studies, to support and enhance diagnosis and therapeutic decisions
Professionalism	Demonstrate punctuality, attendance, and a work pace appropriate to skill level.
	Treat all patients, colleagues, family members, and ancillary staff with respect and compassion.
Interpersonal and communication skills	Demonstrate collaborative practice within the structure of the ED team
	Work effectively with patients and family members through listening and communication skills
	Communicate an understanding of "sick" versus "not sick" to the ED attending physician through succinct presentations
	Communicate clearly and effectively with consultants by posing purposeful and focused questions about patient care and further management

Table 15.1 (continued)

ACGME competency	Learning objective
Systems-based practice	Selectively order and interpret appropriate ancillary studies such as laboratory and imaging tests for efficient disposition of patients in the ED Recognize the need for emergency consultative services in patients whose needs cannot be met by ED physicians Multitask by simultaneously evaluating, treating, and prioritizing multiple patients with different levels of activity

ACGME, Accreditation Council for Graduate Medical Education.

Reproduced from [5] Kessler CS, Marcolini EG, Schmitz G, Gerardo CJ, Burns G, DelliGatti B, et al. Off-service resident education in the emergency department: outline of a national standardized curriculum. *Acad Emerg Med.* 2009 Dec; 16(12): 1325–1330, by permission of John Wiley and Sons Ltd.

Table 15.2 Core topics and procedural skills in a 4-week ED rotation for off-service residents, recommended by the Academic Affairs Committee of the American College of Emergency Physicians.

Core topics	Core procedural skill
Approach to the undifferentiated patient	Basic airway management
Abdominal and pelvic pain	Electrocardiogram interpretation
Airway management	Foley catheter placement
Altered mental status	Intravenous access (peripheral and central)
Chest pain	Ultrasound use and interpretation
Fractures, radiology, splinting	Venous blood draws
Shock	Wound management
Shortness of breath	
Wound care	

Reproduced from [5] Kessler CS, Marcolini EG, Schmitz G, Gerardo CJ, Burns G, DelliGatti B, et al. Off-service resident education in the emergency department: outline of a national standardized curriculum. *Acad Emerg Med.* 2009 Dec; 16(12): 1325–1330, by permission of John Wiley and Sons Ltd.

learning opportunities for OSRs. To supplement this variability in clinical experiences, a targeted didactic program should be instituted.

Several drawbacks limit an OSR curriculum based solely on clinical teaching. Chief among these is the likelihood of a nonuniform educational experience. On a day-to-day basis, there exists an inherent unpredictability of patient presentations in the ED. This translates into OSRs receiving variable clinical exposure during EM rotations.

It is impossible to guarantee that each OSR will encounter a set checklist of chief complaints and perform a list of specific procedures. Furthermore, the EM rotation can be greatly influenced by the ED type (e.g., community, academic, county, trauma center), patient demographics, ED census, and the presence of other learners (EM residents, medical students, other preprofessional students).

Another challenge to clinical teaching is the increasing demand on attending emergency physicians for optimizing patient throughput. The pressure to evaluate and manage patients with expediency leaves less time for discussing with learners and supervising them. This can lead to unidirectional, work-related communication (teacher to learner), which limits educational effectiveness. It can also lead to the inability to use bedside teaching (a subset of clinical teaching where teaching is conducted in the presence of the patient) as an effective instructional tool [6]. Chisholm *et al.* [7] found that only 3.6% of the resident's ED shift involved an EM attending observing direct patient care. Without adequate time available for attending emergency physicians to observe the resident, instituting a culture of clinical teaching and feedback can be extremely difficult.

On-shift didactics

Some academic EDs excuse OSRs and other trainees from clinical duties for 15–60 min daily to attend a structured educational session. These sessions, often called *teaching rounds*, can consist of case-based discussions, chart reviews, skills workshops, or informal minilectures. Teaching rounds are modeled after similar sessions in other specialties, such as “morning report” or “noon conference.”

Teaching rounds offer several advantages. They provide daily protected educational time, targeted to teaching those who are already working clinically. These sessions also help to ensure a more consistent foundation of knowledge transfer regarding common ED presentations, treatment plans, and management dilemmas. Finally, providing a basic foundation of EM knowledge to OSRs with teaching rounds allows more advanced teacher–learner discussions during future clinical teaching scenarios.

The major disadvantage to this teaching approach as the sole educational technique for OSRs is the attending physician's inability to directly assess each trainee's performance in real time. Accurate evaluation of clinical acumen, interpersonal and communication skills, and decision making in the ED requires direct observation and feedback. Furthermore, it can be difficult for the attending physician to tailor teaching rounds to each trainee's knowledge level because the entire discussion group has learners at different stages of training. Teaching round topics need to be planned in advance to ensure the transmission of specific learning points targeted at all levels of learners.

Another major obstacle to instituting teaching rounds revolves around patient care responsibilities. Insufficient resources may preclude residents from being released from the clinical area, even for a brief time. Emergent care issues can arise at unpredictable times, potentially interrupting teaching rounds. This affects not only the residents but also the teaching physicians.

Formal didactics

Although well-developed didactic curricula exist for all EM residents and most medical students, academic EDs use different approaches toward OSR didactics. The Branzetti survey found that among the US allopathic EM residency programs, 31% had no didactics for OSRs at all, 64% sent them to existing conferences intended for other learners (either EM residents or medical students), and only 5% had a dedicated curriculum [1]. Interestingly, almost two-thirds of the programs without didactics felt that no didactics were necessary for OSRs. The main advantage of sending OSRs to conferences intended for other learners is the possibility of some overlap in didactic subject matter with no extra resource required.

The main educational disadvantage of using formal sessions as the sole form of didactic education is that OSRs represent a heterogeneous population with different learning objectives. Internal medicine residents are unlikely to have the same learning objectives for their EM rotation as orthopedic residents, and both these groups are unlikely to share objectives with their EM counterparts or medical students.

Logistical and scheduling challenges also exist in releasing OSRs to attend formal didactic sessions. They may have competing conference obligations, such as their longitudinal outpatient clinics and their departmental lectures. Furthermore, with OSRs attending residency conferences, ED shift scheduling becomes difficult. EM residents are required to attend weekly conferences, leaving the ED to be staffed by EM attending physicians, midlevel providers (if available), and OSRs. Many EDs function less effectively without OSRs helping to offset the deficit in health care providers on EM conference days.

Perhaps, the most important point regarding formal didactic sessions for ED trainees (i.e., EM residents, OSRs, and medical students) is that the heterogeneity of learners almost necessitates heterogeneity in content. A single curriculum cannot be applied to all.

Practical tips to improve models of teaching

There is no single, ideal strategy for teaching OSRs in the ED. Each institution must balance the available resources in the ED, faculty time and availability, and specific needs of the OSRs.

Be a more effective clinical educator

With the growing emphasis on outcomes-based assessment and competency in medical education, direct clinical observation, teaching, and feedback will likely play a greater role in the ED. For OSRs, clinical education should be tailored to the learner. Specific medical specialties have variable content overlap with EM. For instance, a transitional intern entering a dermatology residency will likely not have as strong an EM knowledge base as a categorical third-year resident in internal medicine bound for a cardiology fellowship.

Becoming an effective clinical teacher takes preparation and practice. In two surveys directed toward accomplished EM educators and ED learners on what qualities best characterize a skilled clinical educator, many common themes were found. The combined findings from these two studies, with specific suggested strategies for teaching OSRs, are listed in Table 15.3 [8, 9]. These clinical education principles should not consume attending physicians' time in the ED but rather help them focus on and maximize time toward imparting concise, high-yield teaching points. If practiced on a daily basis, the culture of clinical education will become more routine, efficient, and automatic.

Clinical teaching can succeed only if a facilitating infrastructure exists. With less time for ED attending physicians to observe residents, some institutions identify a "teach-only attending," whose sole responsibility is to observe, teach, and provide formative feedback to learners in the ED. This allows the clinical ED attending to focus almost entirely on patient care and patient flow issues because the bulk of the educational responsibilities has been transferred to the teach-only attending [10].

Establish a didactics component

Institution of a didactic educational component to supplement clinical education for OSRs builds a more consistent educational experience for all the OSRs from month to month. Didactic education, however, does not necessarily mean only a formal lecture series. Although EM conferences and medical student lectures can be viable educational options for OSRs, brief teaching sessions while on shift also provide informal didactic experiences. Teaching rounds should be optimized with respect to timing (during periods of low patient volumes) and learner presence. The teach-only attending mechanism can be effective. Prepared case presentations and minilectures should be available for the faculty to review immediately before the clinical shift to facilitate the teaching process. Many teaching resources currently exist online for free and as part of teaching materials made available via relationships with international EM organizations listed elsewhere in the book.

Table 15.3 Practical strategies to help EM faculty improve bedside education in the ED, specifically for OSRs.

Strategy to improve clinical education	Specific strategies for off-service residents
Agree on expectations for the ED shift	Spend 1 or 2 min at the beginning of the shift to ask residents about their background training level and learning goals for that shift and the rotation overall.
Demonstrate a good teacher attitude	Be approachable and maintain a mutual level of respect.
Actively seek opportunities to teach	For interesting cases, share teaching points with the entire ED team so that other trainees can learn from the cases. For any shift, come prepared with a list of 10 to 12 high-yield talking points that are relevant to off-service residents (e.g., missed foreign bodies in wounds, aggressive fluid resuscitation in patients with sepsis, addressing the most emergent causes of chest pain before assuming the patient has esophageal reflux).
Tailor teaching to learner and situation	Use teachable moments well, teach concise points relevant to the resident's educational goals, respect time constraints, and ask how the resident would have managed a similar case in clinic.
Optimize faculty–learner interaction	Tailor supervision based on the resident's skill level, encourage active learning, and solicit the resident's thoughts on patient care plans rather than dictating the plan from the start.
Provide real-time feedback	Immediately after completion of a task or before the ED shift ends, spend 1 to 2 min to provide positive comments and constructive formative assessments of the resident's medical knowledge, oral presentation, decision-making capabilities, and procedural competencies.
Use additional learning resources	Strategies include suggesting high-yield online resources, demonstrating procedural techniques using models, enhancing radiograph interpretation skills using databanks of images, and exploring specific topics by assigning a publication article to read.

(continued overleaf)

Table 15.3 (*continued*)

Strategy to improve clinical education	Specific strategies for off-service residents
Be a role model and demonstrate useful ED skills	Professional modeling occurs every day with residents learning by direct observation of attendings interacting with patients and staff, multitasking in a busy clinical setting, and dealing with stress.
Improve the learning environment	Find an isolated area in the ED to convey feedback, especially if they are constructive, and make teaching points.
Learn formal teaching techniques from faculty development programs on bedside teaching and providing feedback	Faculty development programs, workshops, and textbooks are available to help attendings learn bedside teaching and feedback techniques.

Based on [8, 9].

Target learners before rotating in the emergency department

Didactics can be moved completely out of the ED. Attending physicians can teach common EM topics at large-group educational sessions held at other departments. For instance, one can teach suturing and wound care at large-group, interdisciplinary workshops at the beginning of the training year. This would not only minimize the number of individual or small-group suturing workshops needed in the ED but also elevate the visibility and reputation of the EM department within the medical school and institution.

Provide self-directed educational resources

Adult education revolves around the concept of self-directed learning, where the learner takes the initiative to identify learning needs and implements a learning plan. Providing OSRs with a supplemental reading material list can help them fulfill their learning objectives. A suggested list of landmark articles in EM was recommended by Kessler and colleagues [5].

Asynchronous educational resources can also be video based. Researchers at the Northwestern University Feinberg School of Medicine developed six prospectively validated 20- to 30-min videos

covering the areas of environmental emergencies, obstetrics and gynecology, orthopedics, otolaryngology/ophthalmology, toxicology, and trauma. These YouTube videos are available to the public (<http://bitly.com/o3l8ZJ>). OSRs given access to these videos demonstrated greater knowledge of core EM topics than the control group, based on a pretest/posttest study design [11]. In addition, there are many free didactic videos, podcasts, and other teaching materials, which are becoming increasingly available. With the help of national and international EM organizations, standardization, updates, and validation studies are currently underway. See www.ifem.cc, www.freemergencytalks.net, and www.epijournal.com for examples of freely available online EM teaching materials.

Conclusion

OSRs play a crucial role in the ED, both as care providers and learners. Their educational experiences vary widely, depending on available resources, faculty time, and learning needs. Educating OSRs is often seen as a lower-priority task (after EM residents and medical students bound for EM), but advocating it as a departmental priority can have significant positive effects for both parties. Academic EM programs should give definite attention to efficient clinical teaching strategies and structured didactic curricula for OSRs. For newly emerging EM programs abroad, efforts at creating a stimulating, educational rotation for OSRs will greatly benefit current and future EM development.

Summary points

- 1 The education of OSRs is often a peripheral focus of academic EDs because they are not pursuing a career in EM. However, patients within their respective specialties often present with acute problems during their outpatient visits or inpatient stay. Therefore, it is crucial that these residents learn and understand the basic EM approach to assessment, intervention and stabilization, prioritization, and diagnostic strategies.
- 2 OSR education should be provided in the form of effective clinical teaching and concise, on-shift didactics (such as teaching rounds).
- 3 Depending on the availability of resources and technological capabilities, structured off-site didactics and online digital resources, respectively, should be incorporated into the training curriculum.

Pitfalls

- 1 Treating OSRs like clinical workhorses within the ED—they deserve targeted EM education and will likely be more effective in the care of patients in the ED if they are exposed to such teaching.
- 2 Assuming that learning objectives of OSRs are the same as those for EM residents or medical students—use the time at the beginning of the shift to ask the OSR about specific learning objectives. This will allow more tailored and efficient clinical and didactic teaching during the shift.
- 3 “Overteaching” the OSR during clinical teaching encounters—minimize teaching pearls to one or two per patient. OSRs will likely see up to 20 patients per shift, and each case provides many learning opportunities. Effective clinical teaching can take as little as 1 min. Target teaching to the learner’s knowledge base, give comments in real time, and create a respectful, nonthreatening learning environment.
- 4 Scheduling on-shift teaching rounds on an elective basis—set specific, practical times for teaching rounds and strictly adhere to them to avoid natural attrition and variability.
- 5 Hesitating to use asynchronous education to supplement in-person didactics and clinical teaching—video-based self-instruction is extremely effective at improving knowledge acquisition among OSRs.

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CHAPTER 16

The education of resident physicians in emergency medicine

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The relationship between emergency medicine (EM) faculty members and their residents is unlike those between faculty from other primary specialties and their medical students or residents. The closer, long-term EM relationship forms the cornerstone of the residents' clinical practice skills and patterns. When EM faculty members are working with residents in their program, they are not contributing to or augmenting the training of future physicians; they are building the foundation.

The learning that takes place in an EM training program is bidirectional. Residents and their faculty become very familiar with one another during the course of a 3- to 7-year period (country and program dependent) and have the opportunity to gain an in-depth knowledge of each others' strengths as learners and teachers. This allows a much more complex learning process that builds on shared experience.

Emergency medicine residency infrastructure and support

The residency office: a hub of activity and a myriad of relationships

The residency office interacts with multiple individuals and agencies in a complex environment (Figure 16.1). Some of these entities

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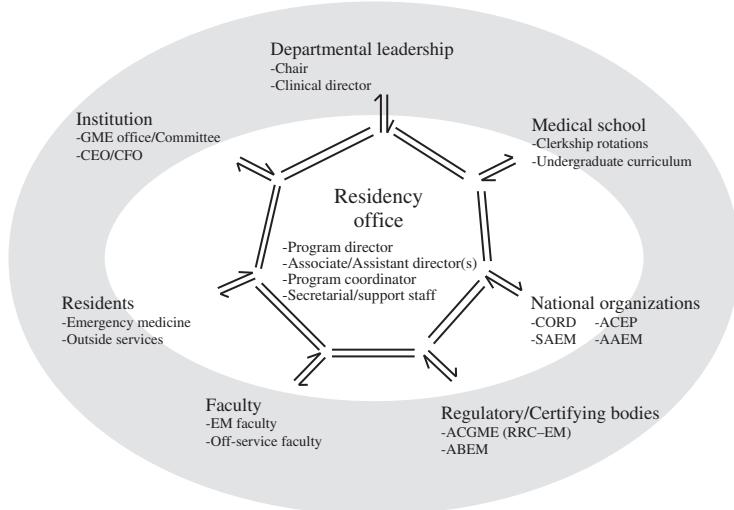


Figure 16.1 The myriad relationships of the residency office.

function as academic or administrative overseers (e.g., dean's office, chair of the department, graduate medical education [GME] office), whereas others can be viewed as constituencies (e.g., the residents and the faculty). Because the residency office is accountable to so many parties whose objectives are often divergent, a program director must possess very strong interpersonal skills. He or she must be perceived as conciliatory and reasonable (someone people would naturally go to for guidance during a conflict) to gain credibility and currency within the institution. It is necessary to be a leader and, at times, a follower as part of a larger GME community. The respect and support of those who provide oversight to the residency office are critical prerequisites for the success of a residency training program. Without which, it is impossible for the residency office to advocate for those things necessary to advance the program.

The residency office must also be resourced properly to achieve its goals. The workload of the residency has periods of greater intensity throughout the year (e.g., in interview and recruitment season and during the orientation of new residents) and periodically throughout the accreditation cycle (e.g., internal reviews, Residency Review Committee–Emergency Medicine [RRC-EM] site visits, or international equivalents). The department must have enough flexibility to devote extra resources during these times. Lack of administrative

Table 16.1 Most common concerns cited by program directors in emergency medicine.

Problem	Likert score average ^a	Standard deviation
Lack of adequate time to do the job required	3.46	1.23
Career needs interfere with family needs	3.39	1.22
Lack of adequate faculty help with residency matters	3.09	1.17
Budget concerns for support of residency activities	3.25	1.29
Inadequate release time for scholarly activity	3.28	1.30

^aScale of 1–5. All other potential problems scored <3.

Reproduced from [1] Beeson M, Gerson L, Weigand J, et al. Characteristics of emergency medicine program directors. *Acad Emerg Med* 2006; 13(2): 166–172, by permission of John Wiley and Sons Ltd.

support for the faculty associated with the residency office is a common concern among program directors and, along with the resultant lack of academic productivity, has been cited as a negative influence on program director longevity. In a recent survey of program directors in EM, the most commonly cited problems associated with their position were inadequate protected time for scholarly activity, a lack of career/family balance, and insufficient time overall to do the job [1] (Table 16.1). This is particularly true in the international setting where EM education and EM systems are in their early stages of development, requiring the founding EM faculty to perform a tremendous amount of clinical and administrative duties, leaving very little time for proper residency attention and development.

Scheduling and its effect on learning

Scheduling of residents and faculty has the potential to create a tremendous impact on education. Many parts of the world still allow excessive and potentially dangerously high working hours for residents and physicians in training. Although the Accreditation Council for Graduate Medical Education (ACGME) duty hour regulations have done much to eliminate the exhausted resident from patient care areas in USA, less has been done to delineate and encourage scheduling strategies that can positively affect teaching and learning.

Fundamentally, teaching requires energy from both the learner and the teacher. Conflicting with this is the obvious reality of 24/7 care, and in EM, both residents and faculty must provide service throughout the night. Multiple authors have looked at circadian

rhythm disruption in the workplace and have suggested techniques to minimize “night shift” effects, but few residencies have integrated these concepts into their schedule. Core sleep preservation (a fixed sleeping period) and forward phase shifting (e.g., a day-shift/evening-shift/night-shift sequence) both serve to decrease circadian rhythm disruption and improve energy levels for teaching and learning [2, 3].

Shift durations for both faculty and residents generally range between 8 and 12 h (the maximum allowed by the RRC-EM in USA). While residents may prefer 12-h shifts to maximize their days away from the hospital, it is likely that a shorter shift duration is more optimal for learning and ED throughput. Recent studies have shown that resident productivity declines reliably with accumulated time in the ED regardless of the level of training. By reducing shift duration from 12 to 8 or 9 h, more patients are seen per hour and there is an overall increase in number of patient encounters per year, thus providing more learning opportunities during the same period of residency training [4, 5]. In our program, faculty shifts are generally shorter than resident shifts, and they are staggered. We try to schedule the residency office faculty on a swing shift that overlaps evenly with two separate resident shifts. This provides an excellent opportunity to maximize the frequency of their exposure to all the residents (Figure 16.2).

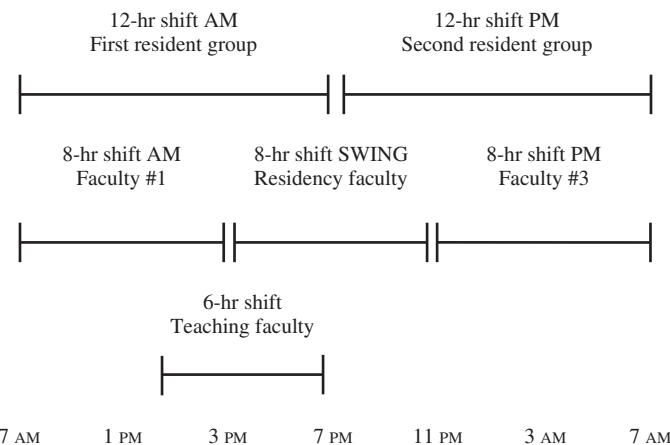


Figure 16.2 A model for scheduling of faculty and residents.

Residency program culture and conflicts

An eternal conflict exists between resident autonomy and patient safety. Although faculty members appreciate the need for residents to have sufficient autonomy to develop clinically, they often worry that too much autonomy will come at the expense of patient safety. Although these two ideals will always exist in some sort of dynamic equilibrium, they are not necessarily incompatible. A common complaint heard from residents about certain faculty members is that they tend to err on the side of “micromanaging” cases and can be inflexible about patient management. Faculty members should consider making changes to a resident’s management plan only if it is dangerous, allowing residents to practice in a safe, but not completely controlled, supervisory environment. This delicate balance must be accompanied by an atmosphere that allows residents to feel comfortable asking for help when they feel unsafe or not yet competent at a particular moment in time. To achieve this, we believe that a culture that minimizes authority gradients in the ED is most conducive.

Assurance of sufficient resident autonomy extends far beyond their relationship with individual faculty members. It is the responsibility of the residency office to provide an environment where residents are supervised but able to make autonomous clinical decisions and perform their procedures, especially during critical resuscitations. If the department of EM is newly founded or lacks sufficient influence at the institutional level, especially in a training institution with large training programs in surgery, anesthesiology, and critical care, it may be very difficult to create the environment necessary for this autonomy to exist. Nevertheless, ensuring patient care access and decision-making responsibility is absolutely critical to the success of the program.

The core competencies

Six core competencies were mandated to be integrated into the US residency training programs in 2001 as the first phase of the ACGME Outcome Project [6]. Although the eventual objective of the project is to improve the quality of GME through measurement of educational outcomes, the initial phase has served mostly to provide a common nomenclature for the process of evaluation. In fact, most of the instructional tools and assessment techniques that were subsequently described to address the six competencies were in use before the commencement of the Outcome Project. The six core competencies, as well as the tools used to teach them and assess them, are outlined in Table 16.2.

Table 16.2 Summary of teaching and assessment tools for each competency that is required by the Accreditation Council for Graduate Medical Education.

Competency	Teaching	Assessment
Patient care	Lectures, particularly those that are case based Internet or CD learning High-fidelity simulation Procedure labs Critically appraised topics	In-service exams CORD exams Med-challenger-based quizzes SDOT Simulation Home-based exams End-of-rotation evaluations OSCE or standardized patients
Medical knowledge	Lectures (traditional or case based) Small-group instruction Morning report case conference CD or online instruction Journal club Assigned readings Models and simulators	In-service exams CORD online Question Bank Homegrown examinations <ul style="list-style-type: none"> • Ultrasound interpretation • ECG interpretation • Core-content area Mock oral assessments Direct observation Standardized direct observation Models and simulators Portfolios
Communication and interpersonal skills	Resident portfolio Resident retreats Lectures on skills Evaluation as teaching tool Faculty model behavior Simulated cases	Direct observations 360° evaluations Global assessment Curtain evaluations Consensus evaluation
Professionalism	Didactic curriculum Case-based discussion Clinical ED experiences encompassing patient management, with application of ethical principles to clinical situations	Written examinations of knowledge, principles, and policies Computer-based or oral exams with embedded ethical issues OSCEs with standardized patients

(continued overleaf)

Table 16.2 (*continued*)

Competency	Teaching	Assessment
	Visually based teaching tools (CD-ROMs, videotapes, Internet-based teaching educational programs)	Modified essay questions
	Colloquial settings and retreats	Direct observation and SDOT 360° evaluation ACGME toolbox: self-administered rating forms and psychometric instruments
Systems-based practice	Administrative rotation Out-of-hospital care (EMS) rotations Departmental and hospital committees Patient follow-up Case write-ups	Bedside evaluations SDOT Resident portfolios 360° evaluations (nursing, peer, ancillary staff) Standardized oral exams with issues involving consultants, interpreters, resources
Practice-based learning and improvement	Evidence-based medicine reviews of clinical questions Journal clubs Critically appraised topics Attending CQI meetings Self-assessment of portfolio Resident-led M&M conferences Mentoring by faculty	Direct feedback on the conclusions drawn by the resident in a journal club conference Feedback from the CAT conference Critical assessment of the resident's periodic portfolio summaries Critical assessment of the resident's M&M conference summaries

CD, compact disk; CORD, Council of Residency Directors; OSCE, objective structured clinical exams; ACGME, Accreditation Council for Graduate Medical Education; CAT, critically appraised topics; CQI, continuous quality improvement; M&M, morbidity and mortality; SDOT, standardized direct observation tool.

Reproduced from [6] Stahmer S, Ellison S, Jubanyik K, et al. Integrating the core competencies: proceedings from the 2005 Academic Assembly consortium. *Acad Emerg Med* 2007; 14(1): 80–94, by permission of John Wiley and Sons Ltd.

For most EM faculty not directly involved in residency administration, three of the six competencies—patient care, medical knowledge, and interpersonal skills and communication—are self-explanatory. The intent of the remaining three—professionalism, systems-based

practice, and practice-based learning and improvement—is not as obvious. They are discussed in the subsequent sections. All six competencies have been defined specifically in relation to EM.

Professionalism

Professionalism appears to overlap with interpersonal and communications skills; however, specific skills and behaviors critical to the practice of EM underscore proficiency in this competency. Some can be assessed in the clinical setting, when observing the handling of patient care transfers (sign-out), during negotiation of ethical dilemmas, and during difficult patient encounters. Others can be evaluated outside the clinical realm, such as compliance with medical record keeping and the multiple, recurrent administrative requirements of residency training. In our program, a component of the professionalism evaluation is completed by the residency coordinator, who assigns a score to each resident. This score is based on the resident's responsiveness to administrative queries from the residency office, integrity in shift trading, fulfillment of teaching responsibilities, timeliness, and overall reliability. Although some of this assessment is necessarily subjective, much of it is easily quantifiable with clear and consistent record keeping.

Practice-based learning and improvement

Practice-based learning and improvement is the critical review of one's clinical work and the growth that occurs as a result of that review. Activities related to evidence-based medicine (e.g., literature searches and journal clubs) as well as peer-review activities (e.g., chart reviews and quality assurance audits) fall under this competency. Perhaps, the most important process in practice-based learning for the emergency physician is patient follow-up. It is difficult to prevent recurrent mistakes and bad habits if one does not regularly follow-up with patients and their care providers. In USA, the RRC-EM specifically requires a formal process for documenting regular follow-up on a selection of patients seen in the ED. Although there are different ways of implementing this requirement, it is critical that follow-up occurs by some formal mechanism. Invariably, the information gleaned by following cases to their outcomes touches on other competencies, especially patient care, medical knowledge, and systems-based practice. We require a simple regular follow-up exercise on a selection of patients from different areas of the department (e.g., major trauma, fast track), including some who are admitted and others who are discharged home.

Systems-based practice

Systems-based practice has a very central meaning in EM. To be considered proficient in systems-based practice, a resident must “demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value” [7]. While this competency may play a secondary role to patient care in other specialties, in EM, expertise within various systems is easily as important as individual patient care. From the beginning to the end of each shift, emergency physicians operate within a set of complex, overlapping, and interconnected systems: the prehospital system; trauma, cardiovascular, neurologic, and other specialized care systems; and the institution’s on-call specialty consultation, diversion, and surge capacity systems. Decisions made in the care of an individual patient affect the care of all other patients in the department. Every decision to pursue a specific assessment or treatment plan is done so within the context of prioritization and by the differential application of a finite set of resources to all patients in the department. Moreover, safe and efficient disposition from the ED requires the highest level of sophistication and understanding of the entire health care system beyond the ED—its inpatient and outpatient components.

Although various tools have been proposed for the teaching and evaluation of systems-based practice, none, in our view, is as important as real-time assessment and direct observation within the clinical area. This can be done by multiple evaluators: faculty, peers and colleagues, nursing and ancillary staff, and also the residents themselves. Supervising faculty in our program are asked to assess EM residents during clinical shifts in real time with respect to their ability to efficiently multitask, delegate, supervise, and interface with the many individuals who and systems that they encounter. They are also asked to comment on the cost-effectiveness of their utilization of departmental resources.

Paradigms for teaching residents

Teaching in a chaotic environment

Several Canadian authors have examined the unique learning environment of the ED and attempted to quantify the relative importance of specific faculty attributes and teaching strategies [8–11]. Several key themes consistently emerge from their interviews and surveys of EM residents and well-recognized EM teaching faculty. As a prerequisite to teach, teachers need not know everything; however, residents must have confidence that they have a mastery of the core curriculum in EM. They must also bring a positive and enthusiastic attitude to the

clinical area. The most effective teachers spend more time listening and becoming familiar with the resident, knowing their strengths and weaknesses, educational needs, knowledge base, and specific understanding of each case. They are also able to work around the well-known challenges in EM teaching (department crowding, time, and patient flow demands) and even turn these challenges into opportunities. For example, when multiple patients present simultaneously, the faculty member might perform triage, explaining the rationale of the decisions made to the more junior members in the department. An effective teaching method is thus used (teaching by example), exploiting a unique opportunity in the ED (a multicasualty scenario), without compromising patient safety. Effective teachers seize on good cases and teaching situations when they occur to benefit all learners in the department. They also give feedback constructively and consistently.

Match teaching to patient flow and acuity

Specific methods for bedside teaching are described elsewhere in this book, but little has been written on the actual mechanics or structure of resident teaching in the ED. Probably, the most important variables that determine how teaching takes place are patient volume and acuity. Other factors, such as the number of trainees on shift at a given time and their postgraduate year level, are obviously important as well. A successful bedside educator's teaching style should reflect the ED's status and staffing at that particular time, and the physician should be able to adjust quickly to the ebb and flow of the department.

During very slow times in the department, when no patients are waiting to be seen, it may be possible to gather the entire team for bedside rounds or for direct observation with real-time feedback. When the department is moderately busy, either a one-on-one patient rounding technique or a small-group technique may be used, with the faculty member mindful of minimizing disruption to patient flow. Teaching can be synergistic rather than antagonistic with patient flow. Practically speaking, this means that specific actions taken and questions addressed during faculty–resident interaction time should be directly related to the patient care tasks that need to be completed, rather than constituting a discussion tangential to the patients who are present. During such “work rounds,” the faculty member can help the resident by completing a task or two for them (e.g., checking laboratory values) to remove some of the time pressure that can impede learning during a busy shift. Valuable pearls can be taught easily during such work rounds, and resident teaching scores of faculty are not affected by ED status or overcrowding [12, 13].

The busier and more chaotic a department becomes, the more “teaching by example” becomes a modality of choice. Faculty can model their understanding of systems-based practice by skillful triage, marshaling departmental and extradepartmental resources, and timely decision making. In the international setting where faculty and workforce availability are often inadequate, this type of teaching is frequently the most often used.

Pursuing educational “nirvana”

As Sir William Osler said more than 100 years ago, “take [the student] from the lecture room, take him from the amphitheatre ... put him in the outpatient department, put him on the wards ... no teaching [should occur] without a patient for a text, and the best is that taught by the patient himself” [14]. “Educational nirvana” occurs when a resident with the appropriate foundation encounters a patient or a scenario that he or she has not encountered before, preferably requiring a treatment or procedure that he or she has not yet performed, with an enthusiastic faculty member acting as a catalyst in the learning process (Figure 16.3). As a catalyst, the faculty member should allow the patient to do the teaching whenever possible, as Osler taught, but he or she can enhance the process by reinforcing the key features of the presentation and/or clinical decision making that need to be recognized for future encounters.

As a resident proceeds through residency and gains more experience with different clinical presentations, occurrences of “educational nirvana” will be less frequent. However, there will still be important subtle presentations of common, life-threatening illnesses that will imprint on their clinical expertise, and every opportunity to emphasize these moments should be used. Because an important rate-limiting step in the resident clinical teaching triangle is the patient and his or her condition, the ideal patient population for a training program

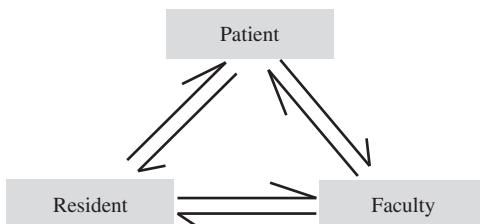


Figure 16.3 The residency education triangle.

is one that is varied and rich with pathology. No teaching tool or technique can substitute for this.

Pattern recognition/visual diagnosis

In EM, pattern recognition and visual diagnostic skills are particularly important. Rapid determination of a treatment plan requires the rapid generation of a differential diagnosis, and in a large number of cases, this is done by simple pattern recognition. When an experienced clinician is able to recognize such patterns effortlessly, it can be quite frustrating for a resident who is unable to draw from a comparable database of experience. Junior residents often ask, "How could I be expected to figure that out?" or "Will I ever be able to pick things like that up?"

Whenever important patterns are recognized or good visual stimuli are available, every opportunity should be taken to share them with other residents and students in the department at that time. By no means does this mean that the department must come to a standstill for a group lecture or bedside session; the patient can simply be pointed out to the other residents, or residents could make a quick trip to the relevant bedside at the beginning of their working rounds. It might be possible to record visual stimuli such as imaging studies, electrocardiograms, and photo and/or video clips (with appropriate patient consent) for later use in a conventional conference setting. We make frequent use of digital video recording to capture critical findings and review procedural techniques. Video recording has also been used to document entire resuscitations for later critical review, particularly in major trauma cases. Although this practice is very helpful from a quality improvement and practice-based learning perspective, it involves medicolegal and ethical concerns that some authorities feel preclude its routine use [15].

Knowledge retention

Although advances in the field of educational theory do not generally make their debut in the realm of GME, some ideas and techniques that have arisen from cognitive science are relevant to bedside teachers in the ED.

Getting residents to integrate new information into their existing fund of knowledge can be a challenge. A common refrain among residents is, "I've already forgotten that three times! I'll never remember it!" Information is often more easily assimilated when it is added to an existing foundation—something that junior residents, in particular, are just developing. When too much new information is presented at once, it is likely that little of the knowledge will be retained.

One mechanism for enhancing retention is to formally link new information gleaned from the bedside to existing knowledge. Once the faculty member knows the resident's existing base of knowledge on a given subject, new information can be integrated with that existing knowledge. By simply asking, "What do you know about this?" and then linking a new piece of knowledge to that existing data, the odds of retention increase.

Because memories appear to last much longer when they are reinforced in a timely manner after their creation, residents should be strongly encouraged to bring at least one new idea or question home from each shift with them for supplemental reading. This will ensure a more lasting impact on and a mental bridge to the clinical experiences of that particular shift. When a resident feels that no significant new knowledge was added during a shift, the faculty member can respond by helping to generate a clinical or scientific question or by asking, "What do you *wish* that you knew that would have helped on today's shift?"

Lastly, *transcribing* newly assimilated information is a time-honored technique to facilitate neural pathways of memory and improve retention. This can be done in several ways: through written summaries, oral presentations, drawing schematics, or teaching others at the bedside. The most practical and accessible method for residents to integrate lessons from the bedside into their usable fund of knowledge is to keep a written or electronic journal to record them. These journals can then be edited and revisited throughout the course of the residency, serving as a living, personal textbook to supplement other materials.

Teaching multitasking

An emergency physician's ability to see multiple patients simultaneously and safely is equally as important as his or her ability to care for each patient. Although formal research on this critical aspect of emergency medical education has only just begun [16–18], many programs have attempted to teach multitasking through the specific structure of their clinical assignments. This usually involves assigning a single resident to a partition or group of beds within the ED for a designated period. Structuring assignments in this way brings a resident's prioritization of time and tasks into focus, in addition to their patient care. We emphasize a two-pass system in the higher-acuity areas of the department. In the first assessment, the acuity of the presentation is determined, with time-dependent tasks identified and started. The second assessment focuses on completing the assessment, disposition, and documentation.

Resident errors

“Primum non nocere” has been a teaching axiom in medicine since the time of Hippocrates; however, errors that induce harm remain a seemingly unavoidable possibility. Error rates vary widely in the literature, with estimates of 3–38% of hospitalized patients suffering an adverse event due to medical error [19]. Error recognition is stressful for residents, but if it can be managed thoughtfully, errors represent a unique opportunity to facilitate learning [20]. Skillful educators are able to minimize the stress and negative implications of resident errors while maximizing their educational value—at the bedside, in the conference room, during one-on-one meetings, and in the resident’s portfolio.

Tailoring the individual resident experience

Feedback: teaching shifts, direct observation, and written evaluations

When it is actually quantified, the time that residents interact with their faculty during clinical shifts is very limited. In one large urban program in USA, mean total interaction time was 20% of the shift duration, with only 3.6% spent with the faculty member directly observing the resident in action [21]. To address this reality, some programs have introduced dedicated teaching shifts (teach-only faculty shifts) to assist the faculty member designated as the attending staff on duty. When these shifts are assigned to faculty members with demonstrated ability and experience as EM teachers, the learning environment is immediately enhanced [22]. The attending staff on duty is now freer to attend to patient safety and flow issues, whereas the “teaching attending” can maximize opportunities for learning.

The addition of a second “teaching” attending to an ED provides the rare opportunity for a significant amount of direct observation of a resident’s patient encounters and procedures. Preliminary studies have linked positive changes in resident skills, confidence, knowledge, and behavior with the occurrence of direct observation in the ED [23–26]. With direct observation comes increased supervision, which has been shown to improve both junior resident performance and patient outcomes [27]. Finally, it also provides detailed real-time evaluation and feedback, facilitating future learning while completing the required documentation of these activities to fulfill RRC-EM requirements and other national residency training program requirements.

Although not all programs have the luxury of additional faculty hours to provide teaching shifts, especially those in newly emerging EM systems abroad, even a limited number of 4- to 6-h shifts at strategic times (e.g., peak volume hours) can go a long way toward

improving the teaching milieu in a program. Excellent performance on resident feedback surveys can be used as a criterion to select faculty members for such shifts, providing an incentive for excellence in bedside teaching.

At our semiannual “face-to-face” meetings with the residents, we begin with their self-assessment in each of the core competencies and their progress in the program’s written goals and objectives for their level of training. This is followed by a review of the objective data and written comments by the faculty (which are organized by core competency and not anonymously). We feel it is important to identify the faculty member giving the specific comments, as it promotes constructive feedback and gives the evaluatee the opportunity to directly discuss his or her evaluation with the evaluator later. We then ask the resident to generate a list of personal objectives for the next 6-month period. Specific weaknesses in the core competencies or areas targeted for further excellence can be identified and formally recorded.

Both faculty members and residents need to feel comfortable giving and receiving feedback. It is not necessarily natural, or easy, to deliver constructive feedback consistently, especially when the performance observed is unacceptable [28]. It may take substantial effort and leadership from the residency office to create a culture in which feedback is delivered regularly and thoughtfully by faculty and residents. It is clear that faculty members need feedback to improve as teachers no less than residents require it to improve as learners.

Graduated responsibility

Graduated responsibility begins on the first day of residency and continues until graduation. Junior residents are supervised closely by both faculty and senior residents while taking care of a small number of less complicated patients. The most senior residents near the end of their training function at an attending level, focusing on patient flow and the supervision of junior residents and medical students, with their attending physician playing a consulting role on only the most complex cases. In getting from one extreme of resident responsibility to another, we propose a slow and stepwise progression of increasing patient volume and acuity as well as increasing supervisory and administrative responsibilities.

EM residency training is an enduring event that involves a significant amount of repetition and service obligation—two qualities that tend to create a sense of stasis in one’s education. To minimize this feeling and create an environment in which residents are more likely to flourish, we recommend a system of graduated responsibility that will continually challenge residents in new ways, while creating a

sense of ownership as their leadership role progresses with their time in the department.

Remediation

Resident remediation and disciplinary issues can be complex for even the most seasoned program director to navigate. They require knowledge of the relevant legal, institutional, and GME regulations. They also require setting clear expectations of residents in writing at the beginning of their training [29]. Although most faculty members will not be responsible for overseeing these issues, their participation in the remediation process cannot be avoided. In *some* cases, it is helpful to have a faculty member external to the residency office act as a coach, mentor, or liaison for a resident because the residency office faculty may be perceived as the ultimate referees of the progress being made. We have used this model very successfully in our program. One essential consideration is that the external faculty member be agreed on by all parties.

In most cases, the entire faculty must be aware of and willing to participate in a remediation process. In addition to the residency office keeping the faculty informed at faculty meetings, it is critical for the individual resident to take a leading role by focusing the supervising faculty on the defined area(s) of weakness.

Didactic curriculum

Although the EM residency didactic curriculum is not the focus of this chapter, the effect of the didactic program on the clinical teaching program is important. In contrast to most medical and surgical training programs, it is difficult to link the didactic and clinical portions of the curriculum. Residents in the ED see undifferentiated patients from all demographic groups from their first day forward, regardless of what topics they have covered in conferences and readings. In our program, which uses a module-based system to cover the essential knowledge base of the specialty, we have recently modified the curriculum to ensure that all the most frequently encountered patient presentations are dealt with early in the schedule. We have also introduced a greater deal of redundancy in the curriculum by repeating core topics such as electrocardiography, pediatric fever evaluation, and neurologic emergencies in each year level, while introducing progressively more advanced concepts and literature at each stage. It is also clearly beneficial to engage the faculty at large in this process, with the curriculum readily available to them so that they can use it as a framework to gauge residents' knowledge base and be acquainted with their learning materials. Making as much of the curricular material available online through a group server is an excellent way to accomplish this.

If this is not possible at one's institution, we recommend the International Federation for Emergency Medicine's (IFEM's) recently constructed series of international consensus curricula in EM. These curricula have been published online and in multiple peer-reviewed journals and are available on the IFEM website (www.ifem.cc) free of charge.

International considerations

Recent natural disasters, global injustices, and the shifting of the global burden of disease from communicable diseases to noncommunicable diseases have brought EM, and more specifically, international emergency medicine (IEM), to the forefront. IEM can be seen as a subspecialty of EM itself, focusing on EM education and EM systems development in those areas where EM systems either do not exist or are not yet fully developed. Combined with an increase in residency programs and board certification abroad (Table 16.3), interest in IEM has vastly expanded in recent years [30–32]. The recommendations made in the previous sections are applicable to teaching residents throughout the world; however, the international realm involves a unique set of challenges that should be addressed.

Awareness: the culture, the pathology, and the system

A thorough knowledge and sensitivity to local culture is paramount to integrating into any system, while avoiding alienation and displacement of local physicians. On occasion, residents on clinical rotations abroad will assume that the behavior they exhibit in their institutions/health systems is acceptable when, in fact, it is not and may be offensive to the local people. This can range from educating residents about appropriate attire when seeing patients to avoiding certain hand gestures or body language considered insulting in certain cultures. Cultural awareness and cultural sensitivity can never be stressed enough, and specific teaching time should be devoted to these issues.

One must also know the local pathology and be competent in treating illnesses endemic to that region as well as the specific needs of the population being served [33, 34]. A large number of tropical locales have very little established EM practice; therefore, an in-depth knowledge of infectious disease and tropical medicine is essential. Residents should be made aware of the clinical conditions that are likely to be seen and devote a significant amount of time learning these disease processes before setting off on their rotation. Many international experiences take place in low-resource areas, very different from the high-technology and comparably cost-insensitive environment of well-developed emergency systems.

Table 16.3 A sampling of EM residencies and board certification in selected countries.

Country	Advanced training offered	Board certification
United States	Yes	American Board of Emergency Medicine (ABEM) American Osteopathic Board of Emergency Medicine (AOBEM)
Canada	Yes	Royal College of Physicians and Surgeons of Canada (FRCP [EM]) College of Family Physicians of Canada (CCFP [EM])
Australia and New Zealand	Yes	Australasian College for Emergency Medicine (ACEM)
UK and Ireland	Yes	College of Emergency Medicine (FCEM, MCEM)
Japan	Yes	Yes
Hong Kong	Yes	Hong Kong College of Emergency Medicine (EEEM)
India	Yes	Medical Council of India (MD in emergency medicine)
Mexico	Yes	Mexican Board of Emergency Medicine
Turkey	Yes	Yes
China	Yes	No
Thailand	Yes	Yes
South Africa	Yes	College of Emergency Medicine (DipPEC (SA), FCEM (SA), etc.)
Singapore	Yes	Yes
South Korea	Yes	Yes

Consequently, the physician must be comfortable with empiric treatment based on symptom presentation and the degree of uncertainty that accompanies this approach. On the positive side, these experiences foster a resourcefulness borne from necessity [30, 34].

Before traveling abroad or very early during their stay abroad, residents should understand the medical system that is in place (both prehospital and hospital based) and how the team plans to augment (as opposed to replace) the local medical system [35]. This involves teaching residents about the local emergency system, if one is already in place, and the remainder of the health care system, with emphasis on the critical care and primary care programs in that region. The goal of this education is threefold: easier assimilation into the local

system, greater appreciation/knowledge of the new environment, and realistic goal-setting for the time abroad.

Sustainability

When teaching abroad, whether the students are native learners who permanently reside in that area or visiting learners who will be there weeks to months, sustainability needs to be emphasized as one of the fundamental goals of any project. While large-scale sustainability (i.e., the creation of a new field or “field development”) is the primary focus of many IEM fellowship programs, it is difficult to attain without long-term commitment, local champions, and significant funding [34, 35]. Despite these obstacles, the importance of field development should be stressed to residents, and small-scale projects that encourage long-term improvements in the local health system should be sought. The keys to sustainability involve the integration of EM into the existing infrastructure, development of relationships with local health officials, promotion of local leaders, teaching others how to teach, the creation of local training programs and curricula, and the establishment of professional associations [30, 33–35].

Conclusion

Clinical teaching in an EM residency should never be taken for granted. Over time, relationships evolve between individual faculty members and residents, enabling teaching and supervisory activities to be tailored to resident-specific educational goals. Although it is our hope that some of the background and suggestions that we have offered in this discussion are helpful, they serve only as a starting point for motivated faculty. Ultimately, the best clinical teachers improve by listening carefully and responding to the feedback of their two main constituent groups: the residents and their patients.

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CHAPTER 17

Teaching residents how to teach

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When a resident enters a program, there is no specific contractual clause that mandates that he or she will be a good teacher. However, residents assume teaching responsibilities almost immediately—informally at first and increasingly structured as they progress. In USA, the Accreditation Council for Graduate Medical Education (ACGME) recognizes the value of the teaching role for residents and incorporates this requirement into the residency accreditation process [1, 2]. Because they were in medical school not so long ago, residents often have insight into students' needs and anticipated knowledge deficiencies. Students are less intimidated by residents occupying "lower tiers" in the academic hierarchy and as a result are often more relaxed and forthcoming. Residents can often better explain the cognitive step-by-step process to a novice learner than can a seasoned attending who makes many clinical decisions using cognitive expertise. The "teaching skill set" for residents does not differ dramatically from that expected of faculty (Table 17.1). This chapter focuses on nonprocedural clinical teaching in the emergency department (ED) itself.

The unique ED practice environment creates many challenges to the resident teacher [3, 4]. Several of them are listed in the following:

- understanding/assessing learners' needs;
- learners' inexperience with acute disease presentations;
- learners' preselected specialty focus, which can limit their interest in a broad patient population;
- variable gaps/strengths in learners' (and residents') knowledge base
 - limited experience with cultural and social issues

- breaking the “*thorough, complete* medical history (Hx) and physical examination (PE)” mentality
- transitioning from information gatherer to assimilator;
- balancing individual patient care needs with education
 - delays can lead to discomfort, inconvenience, or even harm
 - it seems more efficient “to do” than “to teach”
 - timing of interventions (when to usurp care from the learner);
- balancing overall patient flow with teaching
 - deciding which patient to assess first when there is a queue
 - circumnavigating “systems issues” for the learner
 - situational awareness of waiting room, with adjustment of teaching content;
- adapting and adjusting to a “flexible” teaching style;
- using educational resources (e.g., texts, articles, Internet) appropriately;
- assessing learners’ performance (from bedside to grade)
 - direct bedside observation
 - capturing observations about learners during a busy shift
 - creating a summative evaluation (e.g., assigning a grade) by interacting with the learner.

The initial challenge is developing an accurate and realistic expectation of learner capabilities. The emergency medicine (EM) resident most frequently interacts with fourth-year medical students (MS4) or the most junior physicians in training, so this chapter focuses on their interactions (“MS4” is used to refer to both).

Starting the shift: expectations and enthusiasm

Recall the anxiety and feeling of being overwhelmed that accompanies most MS4s as they begin a rotation in our complex teaching EDs.

Table 17.1 The resident “teaching skill set”.

Didactic presentations
– Grand rounds and lectures
– Less structured (e.g., case conference)
– Small groups and workshops
Clinical venue
– Procedures
– Bedside
– Away from the bedside
Learner assessment
Written educational materials

Before jumping right into patient care, defuse some of the anxiety and consider setting the “educational stage” for the shift by asking some of the following questions:

- Where did you grow up?
- Where did you go to undergraduate school?
- What is your medical school/specialty choice?
- Have you worked in the ED before?
- What would you like to learn more about during this shift?
- Do you understand that it’s fine to say, “I don’t know”? I’m relying on you to be completely honest in your answers to me today and to tell me if you aren’t sure about something.

This places the learner at greater ease and sets the tone and expectations for your time together.

MS4s have large gaps in their experiential and cognitive database, interspersed with islands of understanding. Many MS4s have never encountered or cared for a patient with the chief complaint, signs, or symptoms now confronting them. Conversely, their general knowledge base may appear artificially strong if they have had a recent in-depth immersion rotation with similar patients (e.g., their familiarity with doing a slit lamp examination immediately following an ophthalmology rotation). The following questions are helpful in developing realistic expectations of your learner:

- Have you ever taken care of a patient with this illness before?
- Are you comfortable doing this portion of the PE?

If the response to either of these questions is “No” then consider inviting the student to tag along with you as you model the approach to the patient before turning the case over to him or her. This often saves the patient, the student, and you from a large amount of frustration. (*CAVEAT: Explain to the learner that the ONLY way to be in trouble is to delay the implementation of care for a sick patient. Ensure that the student understands that you want him or her to alert you at any time they encounter a patient who appears to be significantly ill. In this scenario, walk the student through the case [as opposed to taking over the care completely]*). You may wish to set a firm time line for the student, for example, “I want you to do the initial discussion of this patient with me no more than 15 minutes after you enter the room.” This prevents the student from attempting a traditional “complete Hx and PE.”

The majority of MS4s have little experience in critical thinking about their patients. Previous rotations largely reinforce the role of “data gatherer” and “observer,” with the team doing the “data synthesis” components for them. Because their initial training and previous inpatient services reinforced and rewarded thoroughness of data gathering, one can anticipate that this component will be overdone. New learners working in the ED almost always gather

unfiltered, extraneous information and are unable to weigh the importance of individual components. The ED rotation is designed to teach them the “broad strokes” of caring for patients with a wide array of undifferentiated conditions. Questions useful in teaching these “broad strokes” include the following.

- Is this patient “sick” or “not sick”?
- What is the most likely diagnosis?
- Do you think this patient will be able to go home, will go home with close follow-up within 1 or 2 days, or requires admission to the hospital?
- If you could order only one test for this patient, what would it be?
- Tell me three things that could kill/harm this patient if they are not diagnosed today?

Do not underestimate the difficulty that these seemingly simplistic ideas may pose to your novice learner (imagine an 80-year-old patient presenting as “weak and dizzy” or the uncooperative patient with “altered mental status”). Using these questions decreases the likelihood of encountering the robotic MS3 “ward presentation” style of regurgitating unfiltered historical data and demonstrates the unique EM physician approach to patient care. Notice also that just as EM physicians tend to be focused and direct in obtaining a patient’s history, these questions are *specific and directive*. Your learner will (hopefully, but not always) quickly ascertain that critical thinking and focus are required during the ED rotation. (*CAVEAT: Ask that all presentations start with a review of any abnormalities of the vital signs during the first 15 s of discussion.*) A recommended learner presentation template is presented in Table 17.2.

The ED patient population is replete with “difficult” or “challenging” patients for many reasons. Learners have rarely encountered this

Table 17.2 Presentation template for learners in the ED.

Have you ever cared for a patient with this chief complaint before? Y/N

Is this patient (check one):

- “sick” (likely to require admission)? _____
- “not sick” (likely to go home after testing and treatment)? _____
- “unclear” (need the test results and response to treatment before I can tell)? _____

Are there abnormalities in the vital signs? Y/N

Which one(s) is/are MOST worrisome? _____

Does the patient have any medication allergies? Y/N

What is the most likely cause of this patient’s symptoms?

What are the two or three WORST things that might be causing these symptoms?

What diagnostic or therapeutic interventions would you like to order?

spectrum of humanity and can easily become frustrated about caring for such patients. Consider advising the learner to ask the following questions to these types of patients.

- What do you think is causing you to feel this way?
- What are you hoping we can do for you here in the ED today?
- (If the patient's symptoms have been present for more than several days.) What changed to make you decide to come in now as opposed to 12 h or 2–3 days ago?
- If I could fix only one of your problems, which one would you want me to fix?
- Are you supposed to take any medications each day for any health problem?
- Have you started taking any new medicines, changed the dose of any medicines, or stopped taking any medicines in the past 5 days?
- Have you ever been in the hospital overnight as a patient?

Electronic medical records have improved our ability to access medical histories for difficult historians, but these questions are useful in preventing potential misunderstandings.

Finalizing a patient encounter affords an excellent opportunity to ensure that a proper plan of care is instituted and that the learner has assimilated (at least short term) the major points (you thought) you taught them. The following are several questions helpful in finalizing.

- What does the patient need to understand regarding his or her follow-up?
- What did you find most challenging about this patient?
- What would you do differently the next time you care for a similar patient?
- What is the most important thing to remember when caring for a similar patient in the future?

Although there are many challenges to teaching in the ED, there are likewise many opportunities to engage in creative activities, particularly in areas of predictable learner inexperience. These include the following.

- Act the part of the consultant on the phone before placing the call.
- Act the part of the family member inquiring about the treatment plan.
- Act the part of the patient who will receive bad news.
- "Dry run" the procedure step by step on a colleague.
- Present scripted 1- to 2-min discussions about common diseases (you may want to keep an electronic file of these).
- Use preselected websites, text tables, articles, and photos.
- Draw information from teaching files of "classic" electrocardiograms with true case vignettes.

- Create an algorithm of key concepts (e.g., the approach to a chest pain patient).

Resident teachers will invariably face the following challenges and pitfalls.

- Assuming that learners can navigate the ED system (and failing to anticipate when they will have difficulties).
- Teaching *too much* about a given patient (focus on two or three “take-home” points).
- Focusing on what interests the teacher, as opposed to what the learner needs to know.
- Teaching specifics (facts) rather than concepts (especially “approach-to” concepts, e.g., “approach to the patient with acute back pain”). Facts are often forgotten or the context is confused. Teaching concepts encourages a cognitive framework that is useful in future similar clinical settings.
- Teaching concepts when directive specifics are necessary because of time constraints (e.g., “Does your patient with acute back pain have fever, immune suppression, or neurologic abnormalities?”)
- Usurping care without explaining why.
- Failing to be directive when patient care is potentially compromised.
- Answering one’s own questions.
- Failing to explain the difference between personal treatment preference and evidence-based treatment.
- Correcting/counseling/reprimanding the learner where others can overhear.

Balancing creative teaching techniques with predictable pitfalls is a learned skill requiring practice and ongoing effort [5]. The most important mistake is equating ED systems knowledge with clinical knowledge and capabilities. The longer one works in the same ED, the more removed one becomes from feeling these pressures. Our teaching EDs are extremely complex, with multiple layers of confusion ranging from patient assignment, ordering treatment or tests, accessing data, and discharging the patient. Residents can usually recall the systems issues that plagued their early shifts. Anticipate that your learners *will* have difficulty maneuvering through the system and protect them accordingly. Again, they are there to learn the “broad strokes” of our specialty, not the intimate quirks and nuances of the ED. It is even more helpful if you anticipate system roadblocks and intervene accordingly.

The second common pitfall stems from the tendency of the teacher to emphasize things of personal interest and confidence rather than the learners’ needs. Paradoxically, the more “expertise” you have in a subject area, the more likely you are to stray in the ED. For instance, rather than discussing the fundamental components of wound care,

you focus on rarely encountered complicating situations (e.g., wound botulism). The learner often has difficulty prioritizing such information and may erroneously generalize the exception into the norm.

Attempting to teach “too much” about each case is a major pitfall for early clinical teachers. It simply seems appropriate to try to share everything one knows about the management of a disease process with the learner. However, just as we do not attempt to provide “comprehensive” holistic care to patients in the ED, do not attempt to provide “too much” information to the learner. Rather than a comprehensive discussion about the ED management of asthma envision what you want your learner to recall about the topic 6 months from now. Focus your teaching on these two or three points. Focusing on more than three points will invariably lessen recall or inadvertently lead to improper emphasis. By developing scripted 1- or 2-min synopses about common complaints (e.g., sore throat, ankle sprain, back pain), you can effectively communicate key information. Using electronic files or paper copies in teaching folders, you can reinforce your message (e.g., a practical article on the diagnosis of strep throat [6], an Ottawa Ankle Rules chart, or a list of physical therapy exercises for low-back pain). Likewise, electronic databases afford rapid access to clinical images, radiographs, and electrocardiograms to augment the teaching interaction. Keep a list of helpful sites easily accessible (bookmarked on your computer, on your USB, or in your smartphone) and consciously include them in your teaching process.

In general, discussions should focus on the “ED approach” to a symptom complex or chief complaint. Diagramming your thought process as you discuss the case provides an additional visual learning tool and is particularly helpful in these general “approach-to” scenarios (e.g., “approach to the patient with headache”). However, flexibility and situational awareness of your work environment is critical lest patients will inadvertently be inconvenienced or even harmed.

During periods of high volume (of learners and/or patients), it is appropriate to become directive and specific [5, 7]. The role flexes from teacher to supervisor. In these situations, encouraging your learner to jot down questions for later discussion affords the opportunity to close the loop and reinforce important concepts. For instance, “Why did we order a head CT scan so quickly on the patient with the sudden onset of the worst headache of her life?” or “Why did we order steroids so quickly for the teenager with the wheezing?” It is common to have multiple learners simultaneously. This may create a queue of learners waiting to discuss their patients. Just as we triage patients according to acuity, quickly explore which patient may be most important to see next by asking, “Who has a patient requiring admission?” or “Who has a patient with abnormal vital signs?”

Early in the teaching experience, it seems awkward to wait for a learner to answer a question. At times, this stems from the obtuse nature of the query, leaving the learner playing the “guess what I’m thinking” game. In general, give the learner time, up to 15 s, to develop a response. If the learner struggles consider rephrasing the question or, alternatively, gain closure by stating, “OK, go ahead and give me your best guess.”

Anticipate the learner’s inexperience in dealing with phone consultants and with sensitive patient–family communications. Do not set them up to fail, particularly when you expect difficult interactions (the “crusty” consultant or breaking the news about a probable lung cancer found on a CT scan). By play-acting the role of the consultant or patient beforehand, you build confidence in your learners and might steer them away from trouble. Stand within earshot to monitor the conversation with the consultant. When bad news needs to be delivered, you might want to model the technique for the learner or at least accompany him or her to the patient’s room.

Several behaviors are universally resented by learners. First, usurping care from them without (at some point) providing an explanation about why you did so. Providing this information tactfully but truthfully is important to the learner’s development. Second, the failure to explain the difference between one’s personal management preferences and those firmly established in evidence-based practice. Much of ED practice lacks the scientific support of large well-designed randomized controlled trials. Communication about clear evidence as opposed to personal preference in the absence of such is important. Third, criticizing the learner in the presence of others, particularly patients, families, or their peers, creates resentment and impedes learning. The ED physical plant challenges the recommendation to “praise in public, perfect in private.” One must be particularly tactful and aware at the bedside. Develop scripted replies for use when your learner struggles, such as, “That’s a very interesting thought” or “That approach works nicely for many patients, but in this situation I think we will use this treatment.”

Assessment

Closing the loop by providing formal feedback about the learner is an important component of the clinical teaching process [7–9]. Conceptually, break the MS4’s patient encounter into three discrete “compartments”: data gathering, data synthesis, and communication/professionalism. Assign a grade (e.g., honors, high pass, pass) to each compartment, then combine them for a composite patient grade. Using the individual patient grades develops composite shift grade.

The data gathering aspect analyzes the history, PE, and use of ancillary information (family, prehospital records, nursing notes, etc.). As discussed earlier, in general, the information gathered will often be unfocused and overly detailed, interspersed with novel problems about which the learner misses critical information. The data synthesis component examines the therapeutic plan (diagnostic tests, treatments, disposition, involvement of consultants, etc.). In general, this component is less well developed than the data acquisition component and invariably includes omissions or, conversely, overuse of diagnostic testing. The communication/professionalism component includes starting the shift on time; attire; work ethics; presentation skills; charting; empathy and interactions with consultants, nurses, prehospital personnel, and secretaries; and bedside exchanges with the patient and family. Note that you cannot accurately assess much of the data gathering and the communication/professionalism components without directly observing the learner. Although some surrogate parameters might provide information (e.g., the upset nurse who complains to you that the learner was disrespectful to a patient), nothing works better than direct observation. Whenever possible conduct these observations without alerting the learner, for humans tend to change their behavior when they know they are being watched (the Hawthorne effect). You can do this by surreptitiously standing outside the examination room or behind the curtain and listening to the conversation or standing near learners as they speak with a consultant on the phone. In general, have low expectations about the learner's ability to navigate in the ED operational system and be liberal with your assistance. However, as the rotation proceeds, repetitive reminders of basic operation components should not be required.

Capturing observations and organizing patient care as a teacher

These two activities challenge even the most experienced clinical teacher. While it may at times be difficult to manage your patient load during a busy ED shift, the complexity increases, seemingly logarithmically, when shepherding multiple learners through the care of their patients. It behooves you to develop a method to organize the care process for patients under your supervisory responsibility. What information you record is less important than ensuring the method that works for you. At minimum, record the patient's age and sex, location, chief complaint, and components of their management plan. You may also wish to have a code to annotate if you have evaluated the patient yourself, informed your faculty about the patient, and written a note on the medical record. Use this form to also record

aspects that you wish to incorporate into your summative evaluation of the shift. For instance, “excellent understanding of issues associated with empiric therapy for strep throat, including CENTOR” or “terrific job explaining treatment plan to the patient, given without medical jargon.” Such details take literally seconds to record during the shift but provide details that allow more than platitudes such as “Good job,” which learners find to be of minimum benefit.

Conclusion

The recommendations presented in the chapter are a compilation of teaching techniques for use in “ideal” circumstances. One can rarely, if ever, bring all these into play, even during a single patient encounter. Instead, the resident teacher must experiment with using varying components as time and patient flow permit. Setting the goal of incorporating several of these strategies over the course of a shift is realistic and greatly appreciated by the learner. Learners appreciate enthusiastic, receptive, and interested teachers. They have significant gaps in their knowledge base and clinical skills, which, coupled with the demands of real-time ED patient flow, mandates a flexible approach to teaching. Conceptually, dividing the patient encounter into data acquisition, data synthesis, and communication/professionalism permits a more realistic performance expectation and assessment. Direct observation of the learner allows evaluation of aspects of data gathering and communication/professionalism that are otherwise not readily assessed. By anticipating system pitfalls and navigating the student through them, the resident teacher more effectively balances patient and learner needs. It is important to develop an organizational tool to allow tracking of patient progress and performance specifics of merit to incorporate into a summative evaluation.

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CHAPTER 18

Teaching to an international audience

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Background

Emergency medicine (EM) is one of the youngest medical specialties in the world and is rapidly growing all around the globe. Emerging in the late 1960s in USA and UK, EM is now a recognized medical specialty in more than 50 countries worldwide. EM is a mature, fully established medical specialty in only a handful of nations—USA, UK, Canada, Australia/New Zealand, Hong Kong, and Singapore. It is in the early or middle stages of development in about 45 countries, and many other countries have little or no EM or acute care systems development at all [1–4]. In the vast majority of the countries in the world, EM is not yet fully developed in the aspects listed in the following:

- EM as a profession and specialty, with governmental recognition, board certification, national professional societies, and specialty journals;
- EM residency programs and educational programs for physicians, medical students, nurses, and other health care professionals;
- trauma system development;
- emergency medical services (EMS) and prehospital services development;
- administrative and management expertise in EM operations and development;

- economic and financing aspects of EM and acute care services;
- health legislation, policy, and public health agenda for EM and acute care [1–6].

Countries with EM systems under development look to nations with more fully developed EM systems, professional societies, and emergency physicians for expertise, education, advice, and collaboration. Over the past 20 years, emergency physicians from EM systems at all developmental stages have looked beyond their borders to learn how EM is practiced in other parts of the world and have become increasingly involved with their international colleagues. The emerging field of international emergency medicine (IEM) is concerned with the development of EM and acute care systems in countries and regions where such development is needed and with encouraging educational, research, and informational exchanges between EM systems around the world [7, 8]. The enormous and growing international community of emergency physicians has a tremendous amount of expertise and advice to share and is increasing its cooperation and collaboration through IEM activities, projects, and conferences.

Many emergency physicians have begun lecturing and teaching in settings outside their countries and outside the EM systems in which they were trained and have gained experience. This chapter addresses important considerations for teaching international audience, including common pitfalls and mistakes.

Technical considerations for teaching international audience

Certain technical pitfalls should be anticipated when teaching abroad. Although many physicians around the world share and understand medical terminology (most physicians learn medicine in English, whether they are fluent in English or not), speakers should be aware of several important technical details when preparing educational materials, practicing lectures, and writing curricula. Senior EM educators can easily leave an audience confused, even in a normally first-rate lecture, if the following language considerations are ignored.

Avoid idioms and colloquialisms

An idiom is “an expression that means something other than the literal meanings of its individual words” [9]. Examples are

- It’s raining cats and dogs
- Something fishy is going on
- The horse is already out of the barn
- We can’t see the woods for all the trees

- German: “Du hast einen Vogel,” which means “You’re crazy” but translates as “You have a bird”
- Dutch: “Ik krijg altijd mijn zin,” which means “I always get what I want” but translates as “I always get my sin”

Although these colorful turns of phrase are meaningful to many native speakers of your own language, they often are misunderstood by people who have only a working knowledge of it. Furthermore, if your lecture is being translated, the intent of idioms becomes difficult to convey, causing delays in translation and further confusion.

Solution: Review your spoken and written educational materials for idioms and language that might be confusing.

Avoid abbreviations

In your spoken language, lecture slides, and written educational materials, avoid using abbreviations, acronyms, and locally relevant terminology whenever possible. Following is a list of few examples.

- Abbreviations on medical charts: HEENT, PERRLA, COR, EXT, DTR, SOB.
- Laboratory and diagnostic data: CBC, H&H, CHEM-7, LFTs.
- USA-specific or country-specific abbreviations: HIPPA, COBRA, EMTALA, ACEP, ABEM.

Solution: Whenever possible, write out terms and proper names to avoid confusion.

Remember local variations

Basic medical education and practice tend to be similar between countries, but many unforeseen differences emerge in the details of everyday medical practice. Examples include the following.

Medical documentation

- SOAP note versus history and physical versus progress notes
 - extent of documentation varies depending on location, culture, language, and use of technology;
 - avoid common abbreviations;
 - spell out medical notes used in your presentations when necessary.

Laboratory test names, laboratory values, and diagnostic results

- Differences in laboratory values, units, and normal values
 - a blood glucose of 75 may be high, low, or normal depending on what units are used;
 - best to indicate HIGH, LOW, or NORMAL, as applicable.
- Differences in use of panels and panel names
 - CBC, Chem-7, BMP, LFTs, and so on.
- Differences in availability of diagnostic tests and turnaround times related to cost, personnel, and training.

Medications

- Differences in drug names
 - trade names versus generic names;
 - lack of access to certain medications because of cost, local formularies, and local sensitivities.
- Different dosing practices
 - amounts, duration, and so on.

Solution: Whenever possible, to avoid confusion, clarify and write out terminology used in documentation, the names of laboratory tests and values, and the names of pharmaceuticals.

Table 18.1 lists some common errors that are made in the presentation of written and verbal medical material and suggests strategies that can avoid confusion and miscommunication.

Interpreter and translator considerations

In many international conferences and educational courses interpreters (for oral speech) or translation services (for written text) are used, who or that translate either simultaneously or sequentially. It is important to find out whether these services will be needed, if they will be available, and which kind will most likely be used.

For simultaneous translation, an interpreter listens to your words (perhaps sitting in sound booths), reads your slides and/or written materials, and then translates the lecture simultaneously to the audience via wireless headphones or other devices. The success or failure of this practice depends on the fluency of the interpreter (including his or her familiarity with medical terminology) and the ability of the lecturer to deliver understandable, cogent material. It can feel as though you are lecturing to the interpreter, who then lectures to the audience on your behalf. The use of idioms or unclear language can reduce the translator's ability to interpret your message.

Table 18.1 Extracts from a hypothetical clinical case presentation that would have to be modified before delivering in spoken and/or written format to an international audience.

(i) CC: 50-yr F presents with rt facial droop and dysarthria × 90 minutes; describes RUE weakness & spasm, polyuria & polydipsia × 1 week		Chief Complaint: 50-year-old woman presents with right facial droop and dysarthria for 90 minutes; describes right upper extremity weakness and spasm, polyuria, and polydipsia for 1 week
PMH: HTN, hyperchol and hypothyroidism		MEDICAL HISTORY: hypertension, hypercholesterolemia, hypothyroidism
PSH: Left hand for CTS		SURGICAL HISTORY: Left hand for carpal tunnel syndrome
SOC: +ex tob, denies EtOH or IVDU	CHANGE TO	SOC: +ex tobacco, denies alcohol or intravenous drug use
CXR: neg		CHEST FILM: negative
CT Brain: old lacunar infarcts, no SAH/SDH		CT Brain: old lacunar infarcts, no subarachnoid or subdural hemorrhages
PE:		PHYSICAL EXAM:
GEN: A&Ox3; NAD, +droop		GENERAL: alert and oriented to person, place, and time; no acute distress, +facial droop
HEENT: perrla, eoml		Head/Eyes/Ears/Nose/Throat: pupils equal, round, reactive to light and accommodation, extra-ocular movements intact
COR: rrr		CORONARY: regular rate
PULM CTA b/l, -r/r/w, GAE		PULMONARY: clear bilaterally, no rales/rhonchi/wheezes, good air entry

Table 18.1 (continued)

ABD soft, NT, -r/r/r, -CVA EXT—c/c/e; pulses = b/l NEURO +2/4 DTR, 5/5 STR; +Rt facial droop; +intention tremor		ABDOMEN: soft, nontender, no rebound/rigidity/referral, no costovertebral angle tenderness EXTREMITIES: no cyanosis/clubbing or edema; pulses equal bilaterally NEURO +2/4 deep tendon reflexes, 5/5 strength; +right facial droop; +intention tremor
(ii) Rx: Lipitor, Synthroid, Zestril	CHANGE TO	MEDICATIONS: atorvastatin, levothyroxine, lisinopril
(iii) LABS: CBC: 8.4 > — — — < 51 32.7 136 91 185 CHEM-20: 3.3 40 \	CHANGE TO	LABS: White blood cell count: 11.4 Hemoglobin: 11.4 (low normal) Hematocrit: 32.7 (low normal) Platelets: 51 (very low) Sodium = 136 Potassium = 3.3 (low) Chloride = 91 CO ₂ = 40 Urea = 36 Creatinine = 0.8 Glucose = 185 (high) Prothrombin time: 12.1 seconds Partial thromboplastin time: 21.3 seconds INR: 1.0 Creatinine kinase: 98 (high)
PT/PTT: 12.1/21.3/1.0 CK: 98		
(iv) VS: HR 115 RR20 BP165/70 T99.4 Pox 96% on RA ECG: inv T'S in III	CHANGE TO	VS: HR 115 RR20 BP165/70 T37 degrees C Pulse oximetry 96% on room air ECG: inverted T-waves in III

Points to be considered: (i) spell out abbreviations; (ii) use generic or chemical names for pharmaceuticals; (iii) be careful with laboratory abbreviations, the names of panels, and local conventions of documentation—always indicate abnormal laboratory results; and (iv) some terms are nearly universal (e.g., ECG/EKG, BP); it is not necessary to write out every term.

Translators who become overwhelmed or confused tend to default to translating the words on the slides instead of the speaker's words; for this reason, it is better in certain situations to write your spoken words on the slides and actually read your slides (something you would rarely do when lecturing to an audience of native speakers of your language). This technique enables the translator to translate your words verbatim and allows the audience to read the slide text along with the translator, if they are able to do so. This strategy can deliver and reinforce your message more effectively. It also allows the slides to be used as written and printed teaching and studying materials because they contain a more complete version of your material than your usual slides. In addition, when a simultaneous translator is reading the slides verbatim, it is necessary for you to pause for a few moments when you finish reading the text on your slide to allow the translator to "catch up" before you advance to the next slide—the translator is usually one or two sentences behind you and reads and translates less than your full text.

Sequential translation also involves a translator/interpreter but without simultaneous translation or wireless headphones. In this technique, the lecturer speaks a sentence or two and then pauses while the interpreter translates the information. The lecturer and translator trade sentences for the entirety of the lecture. This technique brings with it all the considerations and problems of simultaneous translation but introduces a few new ones: (i) the lecturer needs to speak slowly, in only a few sentences at a time, so that information is not lost, mistranslated, or forgotten by the translator and (ii) the audience is frequently several moments behind the speaker and the translator in terms of comprehension and understanding, causing a delay in their reactions, laughter, and responses to questions.

Translation services can double or triple the time it normally takes to deliver your lecture. Furthermore, the frequent pauses and trade-off between lecturer and translator can disturb the natural conversational rhythm of the talk, requiring additional time and possibly reducing the effectiveness of your presentation. This means that you cannot expect to deliver a 60-min lecture in the same time slot. Therefore, you must either shorten your talk or request more time for speaking.

Regardless of whether translators or interpreters are used, you should always allow more time for speaking or delivering your usual lecture when teaching to an international audience, given the unknowns in interpretation, fluency, and understanding. Do not forget that the use of translators and interpreters relies on the proper functioning of wireless or other broadcast technology, so having backup lectures and materials can be useful.

Solution: Always inquire whether translators or interpreters will be necessary and available and ask about the type of translation that will be used. Make corresponding allowances in time, content, and style.

Computer, video, and multimedia considerations

Many educational programs, commercial courses, and books describe the use of computer-based slide and lecture programs such as PowerPoint and Keynote. For this reason, this information is not presented here, except to offer some advice about planning presentations to be delivered in an international venue.

Do not assume that the venue where you are teaching uses the same computer or software version that you use. When possible, bring your own computer, power cords, and projector connector cords.

Save your presentations in multiple versions and on several memory devices (e.g., USB stick, CD-ROM, DVD-ROM) and consider emailing the materials to yourself so that you can retrieve them if you lose your memory stick, hard drive, or computer.

If you are using video or multimedia in your presentations, it is safe to assume that it most likely will not work correctly. To avoid this predicament, use your own computer or arrive enough in advance to test your presentation.

Avoid the mistakes that are commonly made in computer-based slide presentations (Table 18.2):

- poorly contrasting colors of text on background;
- hard-to-read fonts with fancy lettering or graphics;
- too much distracting animation;
- heavy use of photos or video, which can overwhelm or be incompatible with the host computer system.

Solution: The bottom line when using computers and technology for an international lecture: if there is a doubt, there is no doubt. Always be prepared. Make it a common practice to bring your own equipment:

- laptop
- laser pointer
- slide advancer
- power cords
- connector cords for LCD projectors
- electricity adapters (very important and frequently forgotten)

- USB sticks, external drives, and other storage devices
- microphone/recording equipment if allowed/necessary
- LCD projector/beamer if necessary.

Consider bringing substitute teaching materials that you can draw on in case the situation changes or if you are asked to fill in for other faculty members who miss their flights or have to cancel their participation.

Style considerations

Besides these technical details, certain elements of style should be considered when you are teaching to an international audience. While it is important to maintain your sense of style regarding delivery of your lecture and your normal educational practices, certain stylistic details can introduce confusion, misunderstanding, and even offense to your audience.

Presentation style

As with any lecture or educational program, the usual elements of style and delivery should be considered, with several key additional details for the international audience. Your slides might need to be changed considerably depending on the language proficiency and medical fluency of your audience. Consider lecturing with prompts or bullet points for audience who are proficient in your spoken and written language, similar to your home audience. Conversely, consider reading your slides verbatim if translators will be used

Table 18.2 PowerPoint considerations for choice of colors for slides.

Best visual contrast

- White or yellow letters on dark blue or black background
- White on dark red or purple (but this is a less “harmonious” color pairing)

Poor visual contrasts

- Red lettering (tends to blend into background)
- Using overlying shades of similar colors (e.g., blue on blue or black)

Font style for text

- Arial and News Gothic are some of the easiest to read from a distance
- Roman-style fonts and certain angled or script type fonts look good on paper but are hard to read from a distance and when projected on a screen
- Using different font styles for titles or footnotes often looks good

(usually not recommended when lecturing to an audience that speaks your native language). Also, consider using the text of your slides for handouts or take-home educational materials (again, usually not recommended for your home audience). Consider whether computer slides, traditional slide projectors, overhead projectors, whiteboards, chalkboards, or written materials will be used. Do not assume that technologies (computers, Internet, wireless Internet, copy machines, printing machines) will be available or compatible.

Avoid regional, ethnic, and sexual humor

The use of humorous cartoons, photos, or videos can fail totally before an international audience, depending on the local language and culture. Many times, a well-meant joke or cartoon causes confusion or offense and can ruin the overall message of your lecture and presence. Use with caution.

Avoid political and religious commentary

It is very easy to unwittingly insult or offend some or all your audience by the inclusion of remarks, photos, or comments about political or religious topics. Reserve these comments for your private conversations, if you express them at all.

Avoid nationalism and chauvinism

Be mindful of unintended condescension or arrogance. Try not to deliver the “This Is How You Should Do It in Your Country” or the “This Is How We Do It in USA” lecture. Do not assume that your system or practice is the best; many years of international experience has shown that in many ways, it is far from it. Instead, let the content, evidence, and science of your presentation speak for themselves and avoid presenting your native medical system as the best one or the system to be emulated. While this may or may not be true, it is quite easy to offend your audience.

Changes to the Socratic method

Many of the best speakers and teachers actively engage with, converse with, and offer questions to their audience. This is an effective way to teach and present material, to increase retention, to create an appropriate teacher–student relationship, and to gauge the audience’s understanding of the material being presented. However, this practice does not always work when teaching to an international audience, for several reasons. The language being used might be mistranslated or confusing (with or without the use of translators). Moreover, specific cultural norms can cause differences in audience participation.

Some cultures encourage open dialogs and questioning between teachers and students, while others discourage this practice because of the respect for or deference to the teachers and the guests. In these situations, proposing an open dialog or questioning the audience can result in stifled responses or long and uncomfortable silences; conversely, it could result in a free and open discussion, depending on the culture and forum. Audience response can usually be predicted by local teachers and students, based on the local norms of teacher–student interaction during lectures.

Trust your style

When in doubt about grammar and word choice, follow the teachings in the classic writers' manual, *The Elements of Style*, by Strunk and White [12]:

It is an old observation . . . that the best writers [and lecturers] sometimes disregard the rules of rhetoric. When they do so, however, the reader will usually find in the sentence some compensating merit, attained at the cost of the violation. Unless he is certain of doing as well, he will probably do best to follow the rules.

Solution: Know the rules of teaching to an international audience and break them only when necessary.

Anxiety and “stage fright”

According to most studies, people's number one fear is public speaking. Number two is death. Death is number two. Does that sound right? This means to the average person, if you go to a funeral, you're better off in the casket than doing the eulogy.

—Jerry Seinfeld [13]

Common to almost everyone, anxiety and stage fright can be overwhelming to even seasoned lecturers when teaching in an international setting [10, 11, 14]. The perceived importance or gravity of international teaching, compounded by anticipated difficulties in technique and style and combined with all the variables related to local practice and culture, often induce new and uncomfortable levels of “presentation anxiety,” even for lecturers normally comfortable on the stage. Although this material is discussed elsewhere in the book, it helps to reiterate some of these tips in an effort to reduce “presentation anxiety” as much as possible.

- Increase your physical activity. Exercise reduces tension, releases nervous energy, and helps you concentrate. Go for a walk, stretch, and inhale and exhale deeply.

- Try a silly ritual such as repeating to yourself right before you go on stage, “I’m wonderful! I’m wonderful! I’m wonderful!” This empowerment exercise helps to reduce jitters and anxiety and puts things into perspective.
- Practice—an effective performance is grounded in effective rehearsal.
 - Practice in front of a mirror.
 - Give a mock talk in your department or at home.
 - Know your material well enough so that you do not have to read your notes word for word.
 - Rid yourself of distracting mannerisms, such as finger tapping, lip licking, playing with coins or jewelry, or adjusting your hair or clothing.
 - Consider recording yourself and reviewing the lecture beforehand. Initially, this can be a very embarrassing or painful experience, but it brings a new understanding and perspective to your lecturing and teaching style.
 - Watch other lecturers and teachers and study their style. Many great lecturers can be viewed online at sites such as TED Talks (www.ted.com).

You might experience a brief increase in anxiety (the epinephrine speed bump) no matter what you do. The first 30–60 s is usually the worst part of presentation anxiety. Anticipate it and recognize that it will pass.

- Navigate this period by reintroducing yourself, telling the audience where you are from, and announcing the topic of your talk. You might also memorize the first paragraph of your presentation so that you can engage with the venue and the audience.
- Focus on your message and your performance, not on your emotions.
- Nearly everyone who lectures, teaches, or performs in front of an audience feels presentation anxiety. Experts do not necessarily master or eliminate presentation anxiety; instead, they expect it, plan for it, and go forward anyway.

Thematic considerations

The goal of teaching emergency medicine

When designing your lecture, course, or project, it helps to remember the goals of teaching in general, and of teaching EM specifically, and refer to them frequently during your teaching experience. In EM, the goal of teaching is to produce professionals who can evaluate and stabilize every type of patient in the emergency department (ED); advocate for appropriate aftercare; rise to leadership in local,

regional, and national institutions; practice EM with quality, safety, and efficiency; and perform research and publish its results. In short, the goal of teaching in EM is to improve the quality of acute and emergency care to the highest level possible.

When lecturing abroad, teachers can overlook these goals by concentrating on clinical or scientific details instead, causing the broader theme of EM and systems development to be lost. EM and acute care systems development is an ongoing process in most parts of the world, and the best way to assist in this process when teaching in international forums is to concentrate on the field of EM development, rather than on specific clinical areas. Although clinical practice forms the essential base for emergency and acute care systems, the long-term benefits of teaching abroad may come from a wider focus determined by the teaching environment and the audience.

Know your audience

As always in education, it is of utmost importance to “know your audience.” This is much easier said than done, especially when teaching to an international audience, given the tremendous variation of education, practice, language, culture, economics, and EM system development around the world. Before becoming involved in international teaching, consider the following questions:

- Who are the students with whom you will be interacting? (A number of groups are listed in Table 18.3.)
- What will they do with the information you will teach them?

It is vitally important to know the constituency of the audience with whom you will be interacting. This point is frequently overlooked and can result in a mismatch of messaging, teaching, and delivery and a waste of time, money, and effort. Whenever possible, find out who

Table 18.3 Groups that can be represented in international audience.

General public
Medics, paramedics, ambulance personnel, and other prehospital care professionals
Nursing students and practicing nurses
Medical students
EM residents
Non-EM residents
EM physicians in practice
Non-EM physicians in practice
Hospital administrators, managers, and financial professionals
Legislators and health economists
Public health officials and health policy makers

Based on [10].

will be your audience. It is helpful to know their background, levels of training and experience, and receptivity to EM.

Framing your message

To a large extent, the effectiveness and success of teaching depends on the framing of your message. *Framing* refers to the adjustments you can make to your teaching style and technique to ensure that your theme and message are received, understood, and remembered. Many mental, cultural, and psychological details of the environment where you will be teaching should be considered; examples are listed in Table 18.4.

As taught in debate classes and in courses on conflict resolution, legal arbitration, and negotiation, pay attention to the order in which you present your suggestions, arguments, and conclusions. Also consider whether the audience supports or opposes your topic and then frame your “argument” accordingly. When lecturing to a friendly audience or one that generally supports your proposed topic, present your thesis and conclusion *first* and then follow with supportive data. As the audience’s defenses to your position are down, you can concentrate on the details that support your argument as the theme of your lecture or teaching program. Starting with your conclusion first alerts the friendly audience that you are “one of them,” allowing them to concentrate on the data and ascertain how they might adopt your points as their own.

When presenting to an audience that is unfamiliar with or opposes your position, build your argument slowly with data and other supportive materials *first* and then deliver your overall thesis and conclusion. For the unfriendly or “hostile” audience (e.g., individuals who believe that EM systems development is not necessary or feasible), your presentation of the argument in a stepwise manner gives them a series of small less objectionable “yes” steps with which they agree with individually, leading to a larger, overall “YES” to the major theme or argument.

Table 18.4 Audience characteristics to consider.

General educational background and level
Medical educational level
Clinical experience
Legal system
Equipment and resources available
Cultural aspects
How they will use the information or skills

Based on [10].

Context and content considerations

Context: why are you teaching to an international audience?

EM and acute care systems are being developed in many countries worldwide, and many physicians from EM and other specialties, as well as nurses and other health professionals, are becoming increasingly involved with international conferences, courses, exchanges, and programs. Despite your level of international understanding and involvement, it is important to ask yourself why you want to teach to an international audience. What is the goal of your involvement? Is teaching an international audience the best way to assist with EM education and development abroad? Or is there a better way to contribute to the development of EM and acute care systems?

While there are many benefits to international travel, education, and exchanges, consider the following points when choosing the best way for you to be involved and interact with emergency physicians and health care professionals abroad.

What is the best way for you to be involved with EM development in a particular setting?

Teaching and lecturing are common ways to be involved in international EM development, but there are many other methods you should consider, depending on the needs of that particular setting. Other ways of being involved with EM development include meeting with the department, hospital, or government administrators; establishing educational and teaching guidelines; performing research on clinical, operational, or public health needs for EM development; providing consultation on ED operations, design, and patient safety concerns; and establishing and developing EM residencies, EM societies, and recognition of EM as a profession and specialty.

If you will be lecturing and teaching, what will you lecture and teach about?

Will you be lecturing on a specific clinical area or discipline such as EM cardiology, toxicology, or ultrasound? Or will you be lecturing on nonclinical areas such as EM administration and management, EM patient safety and quality improvement, or ED design, operations, and throughput efficiencies? Or will you be lecturing and teaching about EM systems development topics, such as setting up EDs, EM residencies, and teaching programs for medical students; leadership and faculty development; EM society formation; or economic, legislative, and public health policy agendas?

It is important to consider that some topics may have more impact, depending on the state of EM development where you will be teaching. Whatever topic you are teaching should be embedded inside a

longitudinal educational, administrative, and development agenda. Clinical EM in its many complex and myriad details cannot be taught entirely in a modular, short-course format, and EM and acute care system development is a long-term project on the order of 5, 10, or 15 years in most places.

What else can you do while you are teaching abroad?

Often, more work, assistance, and consultation occur outside the classroom than inside. It helps to remember the adage about conferences, which is mostly based on truth:

- If you want to learn about medicine from 3 years ago, read textbooks.
- If you want to learn about medicine from the previous year, read journals.
- If you want to learn about medicine from the previous month, listen to lectures at conferences.
- If you want to learn about medicine for the next year, listen to the conversations in the hallways (and the bars) at a conference.

In addition to their educational value, conferences often spark or encourage changes in the “EM development curve,” serving as psychological and organizational landmarks, and enable individuals and organizations from different, disconnected sectors of a health care system to come together for a common goal. For these reasons, consider the following interactions as unspoken but valuable obligations of your presence abroad.

- Observe and display professionalism and common courtesy. Show up early and stay after your lecture. Do not just fly in, give your lecture, and leave. If you are lecturing as part of a panel or a minisymposium, show up early and stay for the entire panel.
- Whenever possible, encourage your hosts to distribute prelecture and postlecture evaluations.
- Whenever possible and appropriate, consider recording the lecture or conference on video or audio and encourage its distribution in person and online.
- Be generous with the slides related to your lecture and with teaching materials on additional topics.
- Bring a number of lectures and a variety of teaching materials with you. You never know when an opportunity might arise for you to deliver an impromptu lecture, fill a vacancy in the schedule, or simply give away teaching materials.
- Be mindful of differences of opinion and practice. The practice in which you are engaged might be completely different from practices in other locales. You might discover that it is less efficient, effective, or researched than what is practiced abroad.

- You will be regarded as an “ambassador for emergency medicine,” whether this is appropriate or not and whether you like it or not. Keep this in mind while you interact with students, professionals, administrators, and politicians.
- In the words of Jim Holliman, MD, FACEP, “The best advertisement for emergency medicine is the practice of good emergency medicine.” Although EM development varies from place to place, it tends to follow a common pathway, and this process takes years. Focused teaching, education, consultation, and collaboration can shorten this development curve, but nothing replaces established EM courses, residencies, practice, administration, and oversight, all of which need to be built and take time.

Content: how to learn about the state of emergency medicine development abroad

Regardless of the extent of your international teaching experience, it is important to be familiar with the status of EM development in the environment where you will be teaching. It does little good to deliver a well-researched, well-practiced, and well-honed presentation to an audience practicing in an EM system that is years ahead or years behind the level of the lecture. To determine the level of EM development in the city, country, or region where you will be lecturing, it is important to do some preliminary research before going abroad to teach.

Know your audience

- 1 As suggested earlier, ask your contacts abroad about the constituency of the audience you will be teaching, including background, profession, level of training, level of experience, and receptivity to EM.

Know the practice settings

- 2 It helps to know the state of EDs and operational details of medical and EM practice in the area where you will be teaching.
 - a Whenever possible, preferably before delivering your lecture or educational program, make an effort to visit local hospitals and EDs. Pay attention to elements of design, staffing, charting, documentation, computers and information technology systems, and equipment and setup of trauma rooms, resuscitation rooms, wards, waiting rooms, and intensive care units, as well as the hospital grounds, entrances, and access points. Visits to clinical sites are valuable even after your education program to prepare for your next visit or teaching opportunity, whether at the same institution or elsewhere.

b Make an effort to tour the city, if only quickly. Aside from cultural and tourist reasons, city tours give you a feel for the local community and for the historical, cultural, and socioeconomic details of the area where you will be teaching. This information can be augmented by online and written materials on tourism, history, and culture.

Know the EM system

3 Many resources are available to anyone who is considering teaching in international EM, including the following:

- a** in-depth preparation and interviews with your hosts and their colleagues;
- b** emergency physicians and other physicians practicing in that area, at present or in the past;
- c** EM societies, if available—information can often be found online;
- d** online resources on states of EM development by city, state, nation, or region (Table 18.5)
 - The American College of Emergency Physicians (ACEP) and the ACEP Section for International Emergency Medicine support the ACEP Ambassador Program.
 - 1** Contact information for individual ambassadors can be found at www.acep.org/content.aspx?id=25138.
 - 2** The ACEP Ambassador Program also supports Ambassador Country reports, which are written on an annual basis by ambassadors to countries or regions; these reports can be found online at www.acep.org/ISContent.aspx?id=31034.
 - 3** Many other resources on EM and international EM development can be found on the ACEP Section for International EM website: www.acep.org/InternationalSection.
 - The International Federation for Emergency Medicine (IFEM) website (<http://ifem.cc>) contains contact information and other country-specific resources.
 - The European Society of Emergency Medicine (EuSEM) website (www.eusem.org) contains contact information and other European country-specific resources.
 - The African Federation for Emergency Medicine (AFEM) website (www.afem.info) contains contact information and African country-specific resources.
 - The magazine *Emergency Physicians International* ([www.epijournal.com](http://epijournal.com)) supports a robust online forum and social network of more than 2000 physicians around the world.
 - Many peer-reviewed journal articles on the state of EM in many countries can be found online as well.

Table 18.5 Emergency medicine development background resources.

Resource	Website
International Federation for Emergency Medicine (IFEM)	http://ifem.cc/
American College of Emergency Physicians (ACEP)	www.acep.org/InternationalSection/
ACEP Ambassadors	www.acep.org/content.aspx?id=25138
ACEP Ambassador Reports	www.acep.org/ISContent.aspx?id=31034
European Society of Emergency Medicine (EuSEM)	www.eusem.org/
African Federation for Emergency Medicine (AFEM)	www.afem.info/
<i>Emergency Physicians International Emergency Medicine Clinics of North America</i>	www.epijournal.com www.emed.theclinics.com/issues?issue_key=50733-8627%2804%29X0006-7
The CIA World Factbook	www.cia.gov/library/publications/the-world-factbook/

Data from [15].

Summary points

- 1 Know the technical details about lecturing abroad.
- 2 Know how to change your teaching style according to context.
- 3 Know your audience and the EM system you are addressing.
- 4 Do not simply deliver your normal presentations to an international audience.

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CHAPTER 19

The emergency department consultation: teaching physician–physician communication to improve patient outcomes

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Introduction

Synergy—the bonus that is achieved when things work together harmoniously.

—Mark Twain

The two words “information” and “communication” are often used interchangeably, but they signify quite different things. Information is giving out; communication is getting through.

—Sydney J. Harris

Regardless of profession, when working among, between, and concomitantly with others, effective communication is a rate-limiting factor to a successful outcome [1]. In health care, there is no doubt that the central role of clinician communication is achieving positive health

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outcomes in patients. Patient-centered communication, the gold standard, relies wholeheartedly on foolproof and efficient provider-to-provider communication. The effectiveness of provider-to-provider communication depends on the ability of physicians to convey expert advice reliably. More specifically, to provide the highest quality of patient care, a physician and other health care providers must be team players, must be able to work with many disciplines, and must possess the honed skill set to communicate clinical recommendations and management assessments clearly and effectively. Redfern *et al.* [2] proclaimed “effective communication between staff is important in all areas of health care, but is particularly critical in the Emergency Department (ED) because of time constraints, rapid turnover and the complexity of the task and the environment in which care is given”. Communication is an essential aspect of the health care profession, and consultation proficiency is necessary to provide optimal patient care, particularly in the emergency department (ED) [3–5].

Importance of consultations

A consultation is any “service type provided by a physician whose opinion or advice regarding evaluation or management of a specific problem is requested by another physician or other appropriate source” [6]. According to the National Center for Health Statistics, USA, the number of ED visits increased from 23% to 32% in the past decade [7, 8]. Lee and associates [9] reported that 20–40% of patients who are evaluated in the ED and then admitted to the hospital received at least one consultation in the department [9]. In the international setting, where many EM educational and practice systems are still in the early stages of development, effective consultations can help promote communication and proper patient care. Succinctly, consultations are part of the backbone of the emergency medicine (EM) culture.

Medical mistakes have been linked statistically to communication failures [10]. Miscommunication results in costly clinical errors and delays treatment [4, 5, 9, 11]. Patient handoffs between physicians, for example, have been recognized as a process marred by inadequate communication leading to increased patient mortality and health care costs [12]. In addition, a lack of standardization and guidance in ED handoffs has led to inefficiency and increased patient morbidity and mortality [12].

Consultation and communication are also vital pieces of EM education. Consultations fall within the core competency of interpersonal skills and communication, required by the Accreditation Council for

Graduate Medical Education (ACGME); that is, residents must be able to demonstrate effective information exchange and communication with other health care providers [13]. Accreditation agencies for many health professional training programs require documentation of trainees' level of competence in interpersonal communication. Illustrating the importance of developing communication skills, Eisenberg wrote, "Two of the first things medical students learn are history taking and differential diagnosis, but they may not be aware of how these interactions constitute a process of translation during which significant information may be lost. By developing a better understanding of the translation process from story to list and back again, all parties could potentially become more aware of those points of translation which put the patient most at risk" [10]. Clearly, consultations and communication, in general, represent a crucial part of medical education.

With time constraints and overcrowding cited as major problems in providing efficient ED care, an improvement in consultations becomes a plausible node to effect change [14]. The art of practicing consultation and good communication is a critical skill necessary for patient care and physician training.

Taxonomy of consultation

It's not the same to talk of bulls as to be in the bullring (*No es lo mismo hablar de toros, que estar en el redondel*).

—Spanish proverb

Transitions in care, when health care workers exchange specific information and responsibility, are often referred to as *sign-outs*, *hand-offs*, or *handovers* in clinical practice [5, 15]. Patient handoffs and consultations in EM have become key topics of interest in light of patient safety regulations and the 2011 ACGME work hours policy [16]. A challenge to successful handoffs and consultations is how to provide the proper set of essential information to the recipient. The clarity of clinical information of interest shared with another party is absolutely dependent on the situation and cannot be generalized. There is currently neither a standardized method of consultation from the ED for any type of consult nor a widely accepted taxonomy of consultation types, reasons for consultations, or components of information necessary for a successful consultation. Without these classifications, research on the subject is difficult and varied and lacks standardization. In addition, improving specific and measurable objective patient outcomes becomes difficult. Consensus is needed regarding the structure, content, and reasons

for consultations in order to assess the strengths and weaknesses of various taxonomic groups and for simplification of the design of patient outcome studies.

Several players are involved in the ED consultation process. The patient provides a medical history and is a source of diagnostic information. The ED staff, including physicians, physician extenders, nurses, residents, students, and technicians, gather information, triage the patient, and begin the process of identifying treatment options. A consulting physician is sought when the primary team or provider needs expert advice or an opinion regarding a procedure or question.

Briefly, the types of communication can be stratified as handoff versus consultation. A handoff inherently implies a transition in care, an admission from an emergency physician (EP) to another service, such as internal medicine, whereas a sign-out implies transfer of a patient from one EP to another without transferring the patient out of the department. This type of communication occurs in the ED initially among emergency medical services (EMS) personnel, pre-hospital personnel, and the EP and also between physicians during shift changes and outside the ED, it can occur multiple times during a patient's hospital stay. Implicitly, handoffs are "vulnerable moments in emergency care for many reasons, including physical and psychological noise, lack of a backstage, bias for certainty, unwillingness to question prior judgments and decisions, and a lack of resolution to empirical questions due to face concerns" [10].

Like the handoff, a consultation can be viewed in different ways and decoupled: (i) an intervention or procedural consult, (ii) a consult with a specialist, (iii) a courtesy call between services, or (iv) curbside between disparate teams and/or services [9]. An intervention or procedural consult is a call placed by an EP to another service when a necessary intervention or procedure is outside the scope of practice of the EP. A consult with a specialist is a call placed by an EP to another service when a patient's management is outside the scope of knowledge of the EP. A courtesy call between services is a call regarding a patient's current condition made to a physician who was responsible for the patient's medical care in the past. A curbside is not an official consultation but a common situation in which an EP or other physician requests advice from another service for a specific circumstance or for confirmation of a finding. Irrespective of the taxonomy of the consultation type, the ability to communicate effectively is marred by barriers that the trained EP can learn to overcome with the use of a crucial conceptual framework in communication.

Barriers to successful consultations and communication

The single biggest problem in communication is the illusion that it has taken place.

—George Bernard Shaw

A myriad of factors make the process of consultation difficult. There is no standardized model or paradigm for physician–physician consultations. In a survey of EPs, 29% reported a lack of a clear consultation protocol [3]. Another survey found that the majority of EPs believe residents are inadequately trained in consultations [14]. Although each physician subscribes to his or her own style of consultation, the lack of a standardized approach can and has led to omitted information, miscommunications, and, ultimately, unsafe patient care.

Very early in their medical careers, medical students are taught to interview patients and then convey this information to senior physicians. This process has been honed and focuses on simple checklists that frame pertinent information that must be presented. A similar checklist process does not exist for communication from one physician to another. EPs, or any physician, for that matter, generally do not receive formal training in consultations and therefore must struggle to learn the core competency of communication in the job [11, 17]. Many training curricula are limited by the lack of theory or an organizing framework underlying communication skills, a mismatch between assessment and communication skills, an ambiguous definition of communication skills, or the failure to document changes in behavior that persist in actual clinical situations [18, 19]. Unfortunately, evaluation of communication skills is generally limited to subjective participant-reported satisfaction from the encounter. There is a lack of an objective evaluation based on a core clinical competency, similar to the judicious testing of diagnostic skills.

Furthermore, the ED environment can create barriers to consultations and communication. On average, ED staff deal with 42 distinct communication events each hour [20]. Each point of communication is saturated with interruptions: attending physicians are interrupted every 9 min; residents, every 14 min [21]. Routinely, physicians face multiple and overlapping patient encounters. Many patients require unscheduled care delivered by ED personnel who have incomplete knowledge of the individual's medical history. Most EDs are saturated with large patient volumes that create obvious time constraints and can force rushed decisions. In one study, 15% of surveyed EM physicians reported that they are adversely affected by time constraints, leading to difficulty in obtaining consultations [11]. The timeliness

of consultations is often at the mercy of the consultant physicians, their schedules, and their patient responsibilities. In addition, feedback regarding care is lacking because ED physicians typically do not develop long-term relationships with patients. The ED, by its nature, creates a fragmented nature of health care. The combination of physicians from multiple departments, multiple shifts, and numerous nurses and support staff leads to challenging cross-functional communication [10].

Less tangible issues such as stress and personal, social, and gender biases can also contribute to loss of association during a consultation. In the international setting, the uncertainty about the emerging role of the EM physician and the ED can add to the level of miscommunication. This can lead to the so-called inappropriate consults (whether real or perceived). These factors can affect the quality of the consultation, and physicians may become reluctant to consult each other based on their experiences. The consultation process includes both the ED staff and the consultant; barriers to communication can arise from either party [22].

The EP must be able to filter and frame relevant patient information with a concern or question in mind, rather than presenting an unfocused string of information and uncertainties to the consultant. The consultant must then be able to filter the information, determine the reason for which the advice is sought, and advise accordingly. Every stage of this process presents the potential for a breakdown in communication. Cumulatively, these factors lead to difficulties and delays in effective consultation [11, 15] and “ensure that divergent and potentially conflicting accounts will develop across multiple physicians” [10]. It is therefore essential to improve and standardize this process.

Improving communication in the emergency department

Communication works for those who work at it.

—John Powell

Medical personnel communicate constantly. Analyzing effective communication is essential because it is a key factor in providing safe and efficient care for patients and results in better health outcomes [23–28]. Therefore, it is imperative to discuss how communication can be improved in the ED. Communication can be enhanced on a number of levels, including the training of physicians, improving individual interactions, and revamping the steps of the consultation process itself.

A recent study found that a hospital's ED significantly improved in ratings of teamwork while decreasing clinical error rates following training in emergency team coordination and the implementation of formal teamwork structures [29]. The framework called *Situation-Background-Assessment-Recommendation (SBAR)* was developed by the military and has been adopted by health care, typically in nurse-to-nurse communication, and non-health-care fields, such as the aviation industry. The process consists of four steps [30]. The first step is to define the situation. One should determine what the problem or situation is and the reason for the communication. The second step is to help all parties involved understand the background information of the situation. Third, those involved assess the situation, and, finally, recommendations are made to correct it. One key aspect of SBAR is that it can be implemented at the institutional scale down to the personnel level. In addition, it allows individuals to maintain their own communication style. The use of SBAR promises improvements both in patient care and for health care providers. After its implementation, medical centers have reported less missed information during patient handoffs and improved satisfaction among nurses and physicians [31]. A study of nursing–physician communication demonstrated that 68% of nurses believed handovers had improved and 80% felt more confident when communicating with physicians following implementation of SBAR [32].

A large qualitative study of communication in EDs suggests a number of areas for improvement; primarily, the need for more contextual information on patients when they arrive at the ED. More salient facts about circumstances, medical history, and family history must be obtained to improve the accuracy of the translation of a patient's story into clinically relevant data. Briefly, physicians and nurses must become more cognizant of the cognitive process of translating stories from the patient to lists of information (during which information may be lost). The study suggests that, first, hospital staff should work more with police officers, EMS personnel, nursing home representatives, staff members at assisted living facilities, and primary care providers to obtain the appropriate information. Second, as the authors also advocate, a standardized method of consultation or framework should be developed to facilitate transfer of information from one physician to another. The study also suggests redesigning rounds to facilitate group thought and dialog. For example, having nurses “round” with physicians may be beneficial if attention is paid to helping them reduce anxiety and pressure when questioning physician decisions. EDs could introduce conversation techniques that allow feedback between team members and create a mental reflection

on previous decisions. The department should foster communication with personnel in other parts of the hospital, which is critical, given the nature of the ED and the need to consult other departments [10].

Consideration should also be given to improving consultations at the physician level, both giving and receiving [33]. Ackery *et al* suggest that the EP should first learn the consultant's name and give his or her own. This is a simple yet powerful step. It builds a basis for rapport and creates a foundation for positive mutual relationships, which can enhance future consultations. Next, the EP should clearly state what advice or information is being sought from the consultant. This is an active process of reflecting on the problem and identifying exactly what is needed. The relationship between the EP and the consultant must be bilateral. The consultant should actively investigate why the referring physician is seeking advice.

These methods of improving communication and consultations are by no means exhaustive but serve as an example for different levels of the process. The authors believe that consultations can be made beneficial by adopting a standardized process and providing training in its use. In support of this goal, a didactic approach to consultation is presented in the following section.

Approaches to consultations in the emergency department

Technique is communication: the two words are synonymous in conductors.

—Leonard Bernstein

As mentioned earlier, no standardized model of consultations exists. Although every location has different practicing conditions, and each physician may have his or her individual style of consultation, conceptual frameworks can help ensure effective communication. Building on a business model as a framework [34] and detailed qualitative analysis of ED consultations, a modified Delphi method process led to the development of a consultative method called the *five C's of Consultation* [35].

The five C's are contact, communicate, core question, collaboration, and closing the loop (Figure 19.1). This model provides a means of structuring a consultation to improve the efficacy of communication and to address many of the issues described previously, such as standardizing the process and clearly defining needs and a time frame. Generally, EPs gather information regarding the patient, such as history, laboratory test results, and imaging studies. This information is discussed with team members within the ED. When it is decided

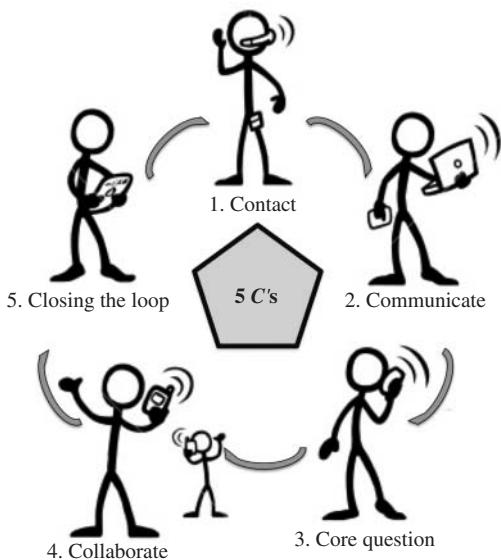


Figure 19.1 The five C's of consultation.

that a consultation is required, the EP begins to define the team's questions for the consultant physician. When the call is made to the consultant, the five C's come into play.

The following sequence demonstrates use of the five C's in a consultation from the point of view of an EP speaking to a consultant. The EP is using the five C's (Table 19.1).

Contact: "Good afternoon. My name is Mary Johnson. I am a third-year resident working with Dr. Fox in the ED today. Who am I speaking with?"

The consultant answers.

Communication: "We have a 30-year-old man with nausea, anorexia, and vomiting. He is febrile to 38.6°C and has focal right lower quadrant pain and mild leukocytosis. We believe the patient has acute appendicitis and will likely need emergent surgery."

Core question: "We are consulting you for evaluation of suspected appendicitis. Could you please come to the ED in the next 30 min to assess the patient and offer recommendations?"

Table 19.1 The five C's of consultation and a description of each of the components that should be considered when preparing for a successful consultation.

Five C's	Description
Contact	Introduction of consulting and consultant physicians and building of relationship. Identify with full name, rank, service, and name of supervisor.
Communicate	Give a concise story and ask focused questions.
Core question	Have a specific question or request for the consultant. Decide on a reasonable time frame for consultation.
Collaboration	A result of the discussion between the emergency physician and the consultant; includes any alteration of management of patient or testing.
Closing the loop	Ensure that both parties are on the same page regarding the plan and maintain proper communication about any changes in patient's status.

The consultant makes recommendations.

Collaboration: “We are happy to obtain a contrast CT scan while you make your way out of the operating room and to the ED.”

Closing the loop: “We appreciate your help. The CT will be ordered stat, and we will expect to see you in the ED in the next 30 min or so. Thank you so much.”

A prospective, randomized controlled study involving EM residents was performed using the five C's training curriculum. The study found that residents trained in the five C's curriculum demonstrated significantly improved consultations, compared with the untrained cohort, as determined by a global rating scale and checklist assessments [35]. At present, interventional studies are testing patient outcomes following physician training with the five C's. In addition, the five C's consultation training is now being piloted for ease of dissemination in an ongoing randomized trial investigating live versus web-based training for medical students.

Future of consultations

If the major determinants of health are social, so must be the remedies.

—Michael Marmot

The developing field of EM continues to embrace progressive changes to medical education. Research aiming to improve the field

of ED communication has begun and will likely continue to direct its goals on outcome measures, including patient safety and cost-effectiveness. Intuitively, it would seem that by improving a clinical consultation, patient safety would improve. While this is a reasonable assumption, there is no body of scientific evidence to prove this causality: “The research enterprise in medical education has been primarily focused on educational, rather than clinical, outcomes” [36, 37]. Increased use of specific communication skills has been documented in simulated situations [38, 39]; that is, research focuses on educational intervention for consultations but does not take the begginning step to examine outcomes such as morbidity, mortality, or research utilization. It is clear that the next step in EM medical education research lends itself toward clinical-outcome-based medical education research that assesses critical gaps in patient safety, medical errors, and resource utilization [40].

Assessments of changes to communication training have been limited to participant self-reported satisfaction, not answering the “so what” question. Future consultation research should focus on outcomes to assess the efficacy of consultation methods. As for cost-savings analysis, outcomes research could evaluate the effect of consultation on the number of tests ordered, the response times to requests for consultations, the amount of time spent in the consultation, the patients’ length of hospital stay, and the number of requests for consultations placed by residents during their shifts. The results of these investigations are likely to confirm the value of a standardized method of consultation, which, upon implementation, is likely to raise patient satisfaction scores and support the medicolegal pragmatism of EM.

Improvements in consultations can be applied to medical education beyond EM to other specialties. Educators can use successful consultation educational interventions to focus and improve educational goals and institutional objectives [41]. This would fill critical gaps in physician education and help satisfy the ACGME requirements. It would also pave the way for cross-disciplinary collaboration between EPs, human factors engineers, communication experts, and EM professional organizations.

EM educators should consider the widespread use of standardized models of consultation, such as the five C’s approach, to improve physician–physician communication and concomitantly provide safer, more efficient, and cost-effective patient care. EM research should continue to target clinically relevant process measures and patient outcomes.

Summary points

- 1 Consultations and communication are intimately related to patient care, medical errors, and EM education.
- 2 Although consultations lack a standardized method, its taxonomy is stratified and involves numerous personnel.
- 3 Barriers to successful consultations and communication include lack of training for physicians, the environment of the ED, and the abilities of personnel.
- 4 Improving consultations involves standardizing the process and specific actions by medical personnel.
- 5 The five C's model provides a standardized method of consultations.
- 6 The focus of future EM research should include patient-based outcomes instead of educational outcomes.

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SECTION 4

Improving as an Educator in Emergency Medicine

CHAPTER 20

Characteristics of great teachers

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As emergency medicine (EM) has developed, increased attention has been directed to its unique learning environment and methods of educating trainees. Gone are the days of “see one, do one, teach one” in the emergency department (ED). As in other medical specialties, the value of refining, standardizing, and devoting study to specific educational practices has become increasingly important. Formal and informal teaching methods have been studied and described in other medical settings (hospital wards, outpatient clinics), but the ED presents distinct opportunities and challenges to both teaching and learning.

Benefits enjoyed and challenges faced when educating in the ED are often two sides of a coin. This setting has a large daily volume of patients (providing a breadth of conditions) but a higher degree of regular interruption than in a clinic or a hospital ward. Learners come from a wide variety of specialties rather than a monospecialty team, bringing not only diverse experience but also a variety of styles and needs. Learning opportunities are available around the clock, rather than just during normal business hours, but shift times may be asynchronous among levels of training, leading to “no good time” for dedicated learning. In many settings in the world where EM is new or developing, the number of trained EM physicians may be limited, as is the opportunity to devote time to teaching. Learners and educators must be aware of these constraints while maximizing opportunities and advantages in the ED setting.

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What, then, makes a teacher great in the unique environment of the ED? EM-specific research highlights widely accepted characteristics of superior educators and agrees with evidence presented from other medical specialties. To fully understand what makes an EM teacher great, one must explore what learners want from their teachers and what established EM teachers consider good practice. Also important is the consideration of different teaching styles in the unique ED setting and identifying barriers to great teaching.

What do learners want from their teachers?

Several studies based in ambulatory clinics or hospital wards have identified what learners—medical students and residents—believe are characteristics of good teachers. Those meta-analyses of the characteristics of effective clinical teachers and their teaching methods revealed that educators take on several important roles: effective supervisors, dynamic teachers, role models, supportive helpers, and successful planners and resource users [1, 2]. These roles shift in preference depending on the learner’s level: medical students generally prefer traditional instructors (teachers who control the environment), whereas residents more frequently describe good teachers as those who are supervisors and supportive of their autonomy [3].

From each specific educational experience, learners value those who teach with enthusiasm, state answers and objectives clearly, offer opportunities for problem solving, and provide true mentoring [4]. A focus group of internal medicine residents identified a set of characteristics for “skilled” bedside teachers, arguably the most frequent type of instruction readily available in an ED. They concluded that faculty members who had the ability to conduct timely, efficient, and beneficial bedside instructions for a variety of learner levels, and were unafraid of the barriers to bedside teaching, had the greatest success in this particular medical setting [5].

Studies of EM learners mirror these findings. A focus group of students, residents, and off-service intern ED rotators developed several consensus principles of effective teachers: those who seize the teachable moment, give appropriate feedback, are learner centered, have a good attitude, and are good role models with effective teaching skills [6]. The teacher’s level of training (resident, junior staff, or senior staff) was found to be unimportant if teaching was tailored to the learner’s needs. Other educator characteristics that EM learners value include efficiency, organization, knowledge base, adaptability to barriers, and respect for patients [7].

Learner preferences also differ by generation. An assessment of EM intergenerational differences found that younger trainees (most of

today's students and residents) have a more informal learning and interpersonal style and expect individualized, timely feedback and guidance in each educational encounter [8]. They prefer direct, well-defined expectations and consequences and small-group or interactive settings with focus on patient care.

What do medical educators believe are the characteristics of great teachers?

Historically, medical education has progressed "on the shoulders of giants"; that is, each generation of teachers learns from those preceding it. Only in recent times has serious studies been conducted to investigate *why* great teachers were considered great and how they imparted their knowledge and methods to their students. With the premise that all teachers are learners first, several studies on accomplished physician–educators have investigated how these instructors achieved success. The influence of positive role models was stated unanimously; this is particularly important because many teachers receive little or no formal educational training or supervision [9, 10]. Institutional encouragement, recognition, and promotion of formal and informal teaching and establishing dedicated time strictly for education are also seen as critical for the development of excellent medical educators. However, time constraints and support for educational endeavors vary widely among settings and may be particularly challenging in international EM departments.

Medical educators across specialties have proposed characteristics of an "ideal" medical teacher: someone who is stimulating, encouraging, competent, communicative, and knowledgeable [11]. Great teachers possess both cognitive (academic or methodologic) and noncognitive (personal or relational) attributes that contribute to success [12, 13].

In a survey of accomplished (award-winning or highly promoted) EM teachers, several strategies were identified that contributed to a superior learning experience. In short, these educators believed that all the following contributed to their educational success: learner-centered activity, tailoring teaching to the situation and environment, acting as a role model with a good attitude, and efficient use of all available resources [14]. The greatest success comes to teachers who focus their information on the needs and levels of the learner, create an environment in which expectations are clear and mutually agreeable, and show active involvement in patient care. These educators also suggest that having different teaching strategies on hand for any situation, for example, busy or slow times, day or night, with solitary students or a mixed group of learners, allows them to deliver a consistent product regardless of the circumstance.

Table 20.1 What do learners and educators think makes a great teacher?

Learners	Educators
Learner centered	Learner centered
Role model	Role model
Ability to "seize the moment"	Ability to "seize the moment"
Enthusiasm/positive attitude	Enthusiasm/positive attitude
Efficient and organized	Direct involvement in patient care
Overcomes educational barriers	Adaptability
Strong knowledge base	

Synthesis of the research described earlier on both EM- and non-EM-based learner and educator preferences reveals several core truths (Table 20.1). Perhaps, most appropriate to the ED, educators who take time to teach—or “seize the teachable moment”—without fear of the many barriers to instruction are highly valued by learners. Enthusiastic teachers who are learner centered and patient centered in their approach deliver the highest-quality educational experience. This places demands on the educator in regard to how to tailor instruction to a wide variety of learner backgrounds and styles. The best teachers are able to provide instruction in an efficient, organized manner. Perhaps the most important, but also least tangible, requirement for great teachers is that they act as positive, enthusiastic role models with an excellent attitude. These approaches maintain the time-honored tradition of mentoring medical professionals as an important function in modern education.

What styles and strategies do great teachers use?

In the constantly changing environment of the ED, great teachers marry a set of tried-and-true teaching styles with the current needs of the learner group and the demands of the circumstances at hand. Strategies that promote excellent learning have been developed for both formal and informal education settings. Because the settings vary, teachers must also be flexible in their personal style—alternatively authoritative, collaborative, suggestive, or collegial—as appropriate to the situation.

Formal teaching settings

Teachers can choose among several lecture styles to convey information. The oldest and most common of these in medical education is

the didactic lecture. In this format, the teacher conveys his or her knowledge directly to a group of learners, with little interruption from questions or interactive discourse. Although this is a common and efficient strategy used in medical education, it is not applicable in a busy ED [15].

An interactive style of teaching, with a steady flow of questions and answers between teacher and learner, is more engaging and often more appropriate for the ED. To stimulate learning, superior educators are skilled at maximizing the yield from a series of focused questions. These teachers ask clear, targeted questions appropriate to the learners' levels; allow for multiple correct responses; use queries that require more sophisticated thought than a simple yes/no; and, perhaps most importantly, allow sufficient wait times (3 s or more) for a response [10, 15].

In addition to strict lecture and questioning styles, EM teachers may have opportunities to provide direct demonstration of a particular technique or procedure to students and residents. This may seem time consuming and inefficient, but experiential learning has been shown to be quite effective in learning and applying new knowledge or physical skills [16]. This demonstrative style can ultimately foster the autonomy of learners because it introduces them with a standard skill set that they can then work to improve.

Informal settings

By necessity, much of EM teaching takes place at the bedside. Despite challenges, this environment meets learner and educator goals for patient-centered on-the-go adaptable teaching. A model of best bedside teaching practices has been proposed and provides strategies for three distinct domains: patient comfort and involvement, focused teaching, and group dynamics [17]. First, permission is asked of the patient and after it is granted, all learners are introduced. The primary caregiver provides a brief overview, and the case is discussed with clearly defined teaching points. Throughout the experience, patient understanding is ensured and a team member follows up individually with the patient to clarify misunderstandings. After the bedside encounter, focused teaching applies the microskills model (described later), role modeling, and practice. Both the goals and time spent are limited, and all members are included in teaching and feedback.

The microskills model of clinical teaching (Table 20.2) provides a framework for structuring the educational experience described previously [18]. The first two tenets of this model are learner centered: "get a commitment" (allow the learner to present and commit to solving a particular case or problem) and "probe for evidence" (analyze the learner's reasoning so that gaps in knowledge or thought process can

Table 20.2 The microskills model of clinical teaching.

Get a commitment
Probe for supporting evidence
Teach general rules
Reinforce what is right
Correct mistakes

be ascertained). The educator then teaches “general rules,” which are standardized bits of knowledge targeted to the learner’s level. Finally, the teacher “reinforces what is right,” that is, supports accurate knowledge, and “corrects mistakes” by discussing errors and how to prevent them in the future. By remaining learner centered, this model gives learners what they seek, enables great teachers to deliver a consistent experience, and can be practiced informally at the bedside or elsewhere.

Another popular strategy for informal clinical teaching is to have a set of well-rehearsed “teaching scripts” on hand that can be applied to various cases [4, 19]. Great educators choose their teaching cases wisely and focus on those that will maximize learning broad concepts.

An expert opinion describes the “WALK the TALK” strategy of clinical teaching, which synthesizes learner and educator preferences with practical applications of bedside teaching styles (Table 20.3) [20]. Educators seize the moment in an interactive, patient-centered, hands-on manner, in which clinical uncertainty is seen as a teaching opportunity

Table 20.3 “WALKing the TALK” for effective clinical teaching.

WALK	TALK		
Wear gloves	Promote hands-on care	Think out loud	<i>Teach the process, not just the outcome</i>
Adapt (enthusiastically)	See clinical uncertainty as opportunity	Activate the learner	<i>Promote learner's initiative and autonomy</i>
Link learning to caring	Show and expect empathy and responsibility	Listen smart	<i>Assess the patient, then the learner's interpretation</i>
Kindle kindness	Establish a standard of generosity	Keep it simple	<i>Teach efficient communication and decision making</i>

Adapted from [20] *The Lancet*, Reilly BM. Inconvenient truths about effective clinical teaching. 2007; 370: 705–711, with permission from Elsevier.

rather than as a barrier. Students are led through the process, rather than simply reporting the outcome, of medical decision making in a way that promotes self-directed learning and efficiency of communication. These core practices were reiterated in a survey of teachers and students in the ambulatory setting, where involving and stimulating learners and offering clear expectations with skillful patient care significantly predicted overall teaching effectiveness [21]. This approach may be especially useful in the international setting, where formal teaching time may be constrained, but bedside opportunities for informal education remain plentiful.

What are the barriers to (and the solutions for) successful teaching?

The numerous barriers to effective teaching that have been detailed by medical educators and learners can be divided into three categories: learner, teacher, and environment [5, 14, 20]. Learner barriers include a lack of interest, preparation, time, and resources. Teacher-centered impediments include lack of time and resources, discouragement of teaching in favor of billable activities or research, lack of thorough knowledge of the topic at hand, lack of formal teaching skills, and personal factors such as burnout and ego. Environmental obstacles relate to the physical makeup of the educational setting, the variability in patients' conditions, and the degree of support for teaching within the institution. EM teachers face challenges that are not faced by the ward or the clinic: the physician staff usually has no prior relationship with the patient, the patient's condition is usually unknown at the time of interaction (i.e., the undifferentiated sick patient), and every busy ED staff experiences a high degree of interruption. Furthermore, evaluating educational success is complex and multifactorial, and the best method of assessing EM educators is not fully known [2].

As noted, successful teachers are undaunted by the many challenges to medical education. Indeed, available evidence shows that environmental or workload constraints have no significant effect on teaching scores [7, 21, 22]. Learners rank those teachers highest who had excellent teaching skills, showed a willingness to teach, and established a positive learning environment, irrespective of the available patient case mix, faculty workload, or design of the clinical site. Faculty development workshops have been shown to meet educator needs for improving teaching skills and encourage innovation in educational methods and approach [23].

Great teachers use the resources that are available to them. They are aware of the unique obstacles to high-quality education in the modern, busy ED but develop strategies to minimize these impediments.

Using the microskills model, some have proposed a “one-minute teaching” strategy, in which learners and teacher perform history taking and physical examination together and then learners commit to a diagnosis while the teacher assesses their reasoning and focuses on a *single* teaching point, corrects mistakes, and reinforces correct thinking [4]. Even a busy ED shift is permeated with multiple “one-minute” opportunities for the successful teacher to identify.

In the ED, great educators know patient flow well enough to identify times that tend to be less busy, when dedicated teaching might occur. When possible, they adopt unused areas within the department, for example, a code area that is rarely occupied, for educational sessions so that they are subject to fewer interruptions. Other creative solutions include regular, weekly “board rounds” for which on- and off-shift faculty, residents, and students meet briefly in the ED to discuss currently active cases. This strategy provides a fresh perspective, positively affects patient care, and uses available resources for problem solving [24].

Conclusion

Great teachers of EM are a diverse group of clinicians and academicians, but the core behaviors and principles that promote their success are standard. As Bannister *et al.* [12] noted, “[a]lthough we continue to have difficulty defining the critical characteristics of a great clinical teacher, identifying such a teacher is easy: they are the ones to whom students and residents flock.” A primary focus on learners, enthusiasm and proper role modeling, adaptability and an undaunted ability to seize the teachable moment are all as important to effective teaching as a strong knowledge base and clinical acumen. What learners and teachers want is the same: to provide the best possible educational experience in any available setting. The ED is a unique environment with its special challenges, and good teachers in that environment use simple but powerful strategies for success.

Summary points

- 1 The ED is a learning and teaching environment like no other, and educators must be aware of the unique advantages of and constraints to imparting information.
- 2 EM learners value teachers who “seize the moment,” are enthusiastic role models, and can adapt to various learner backgrounds and styles.

- 3 Great EM educators should be learner centered, well trained, directly engaged in patient care, efficient, organized, and aware of their status as role models.
- 4 Various teaching styles may be used by EM educators, including the microskills model, using teaching scripts, and using single cases to illustrate broad concepts.
- 5 Although the ED poses significant time- and resource-related barriers to effective teaching, successful educators use what is available to them and develop strategies to minimize these challenges.

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CHAPTER 21

Effective presentation skills

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Introduction

As a teacher of emergency medicine, you will sooner or later be asked to give a talk. Your reaction to that request will depend on a number of factors, including the didactic sessions you have heard throughout your education. You have been exposed to hundreds—if not thousands—of hours of talks during your career. Which ones are still clear in your memory? What made them exceptional? When you think about what makes a certain talk unforgettable, the features that almost certainly stand out are a knowledgeable teacher who was excited about the material and who was clearly eager for you to learn. That educator knew the material and projected enthusiasm for it. The talk was simple and well organized, which made it easy for you to take notes. There were only a few take-home points, and they were reiterated throughout and at the end of the talk. Also, the speaker finished at least 2 min early.

Why have you forgotten the hundreds of other talks you have attended? If you think about it, you will recall poorly prepared speakers monotonously reading from slides with minuscule print, giving encyclopedic knowledge with no clear beginning, goal, or end point. That is what you must avoid if you want to be one of those memorable teachers your students speak about with admiration years after you have influenced them. This chapter presents 10 principles you must follow to achieve that goal.

Warning: this chapter does NOT cover the use of PowerPoint® and other presentation materials. For that, you can refer elsewhere [1].

10 Principles for becoming a memorable speaker

Rule #1: Know the type of talk you are giving

You will give two types of talks through your career. The goals for each type are the same: impart knowledge, change practice, and improve patient care and outcomes. The structure of these talks is very different.

The core content talk

This type involves an apparently simple transfer of knowledge from a textbook chapter to a slide set to the mind of your learner. Initially, this looks easy—just copy and paste from the online version of the textbook and make up a bunch of slides. If you do this, it will be almost immediately apparent to your listeners that you have cobbled together endless facts that they cannot possibly absorb. They would be better-off if you just photocopied the chapter and gave it to them to read during quiet time.

By definition, the core content talk must cover masses of material, much of which must be recognized or memorized. You can help your audience get a handle on the important material by dividing the essentials into bite-sized chunks.

For example, you are assigned the topic “Oral and Dental Emergencies.” Outline your talk on paper before you ever go near the computer. Decide on the text you are going to use and see how the material is organized. Divide the topic by anatomy, from exterior to interior: lips, teeth, gums, tongue, palate, uvula, tonsils/peritonsillar area, and posterior oropharynx. Talk about the important conditions affecting each of these structures and how to treat them, for example, lips—angular cheilitis (perlèche), herpes simplex (cold sores), lacerations and regional blocks, and vermillion border. Next, talk about the teeth—teething, caries, third molar pain, periapical abscess, pericoronitis, postextraction pain and dry socket, postextraction bleeding, and chipped, loose, avulsed, and missing teeth. When you have finished your outline, then and only then should you start making slides and looking for illustrations.

If you follow this technique, your talk will be organized so that your audience can take notes in an outline format. Their notes at the end of the talk should look a lot like the outline you used to develop the talk. Your outline also makes a natural handout—give it to your audience and let them fill in the blanks.

This type of talk supplements the written material, so your audience will benefit more by reading the assignment either before or after the presentation.

The other talks

There are many other reasons to give a presentation. You may want to present the results of your research, pass on a new message, disentangle frequently confused information, motivate a change in practice, communicate a vision, or share a new and striking concept. The important thing to remember is that you must deliver information that the audience cannot simply obtain by reading a journal paper, and you always want to point your audience to additional learning resources.

For a 60-min talk attended by 40 people, the cost is 40 person-hour times the hourly value of each person's time plus the time spent traveling to hear the talk. If what you present could have been accomplished reading an article for 10 min at the breakfast table or in the subway, you have wasted a *huge* amount of peoples' time.

The mark of a bad presenter is not necessarily withholding information, but giving too much without presorting and editing. This is not the time to become a human encyclopedia, inflicting fact after fact on a numbed group. Rather than saying more, you should say less. Concentrate on delivering three to five major points. Your audience welcomes distilled information and a road map for learning. Again, think of the best presenters you have heard. They anticipated the question you might ask and answered it without prompting. That is the mark of a great teacher.

Another advantage of putting across a limited number of major points is that it makes your job of developing the talk easier. Instead of a 45-min talk, you are now developing three, four, or five talks, interrelated, but each only 9–15 min long. It is a lot easier to write a 10-min talk than to develop a coherent 45-min talk.

Now that you have a 10-min block, write down the point you want to make in that segment. Only after you have the conclusion should you start developing that section. Your goal is to spend 9 min developing the argument that was started in the last 1 min, much like a lawyer.

Rule #2: Know your audience

Speaking to a group of residents and/or medical students presents its own unique challenge [2, 3]. It is really the "core content" talk that residents need as a base of knowledge to build on. As residents progress into their senior years, they may be more interested in the "other talks," but these talks are pretty much useless if there is not a strong base of the core content.

When speaking to residents, remember that they will be overworked and stressed out. A group of residents have a shorter collective

attention span than a national audience, so take this into consideration when planning a talk for them.

A national audience is coming to hear you voluntarily and has possibly paid a lot of money to hear you talk. On the other hand, a group of residents are probably required to be there and might rather be elsewhere. While the goal of a speaker is to cultivate an engaged audience, a group of residents are a captive audience. This could make the task of holding the audience's attention even more daunting. Talks to residents may need to be shorter, or have extra breaks, or be less text heavy. It is very important that the topic is relevant and interesting to someone learning the craft of emergency medicine.

Most current residents and medical students are members of the "millennial generation," born in the 1980s and growing up in a high-technology environment, so their educational needs and learning strategies are different from those of previous generations. They are more reliant on technology as a learning modality and they expect immediate answers to their questions. This generation prefers a team-oriented approach to academics and may require more positive feedback than older generations. Whether you like it or not, this is true. People considered outstanding teachers 20 years ago may now be regarded as boring, tiresome, or old hat.

What if you are invited to speak at another hospital across town, for a residency program, or in an unfamiliar setting? Do not assume you can give the same talk you give in front of a sympathetic crowd of people you work with daily. Find out who will be present—physicians, nurses, administrators, lay people. Are they all emergency physicians, or can you expect some trauma surgeons, family physicians, and hospitalists in the audience? What is the anticipated audience size? Why are they attending—required continuing medical education? Do people come primarily for the free lunch? Is it a mandatory talk to meet some hospital or state requirement? Does your host want you to make specific points? Can you expect disagreement from certain audience members? The more you know about your audience, the easier your job will be.

Make sure that your cutting-edge technology is compatible with what is available at the speaking venue. Know whether you will be restricted to using a laptop at the podium or will be able to wander freely and use a remote control.

Rule #3: Know your ending

Why is this topic next? The end of the talk is the earliest part of the talk you should develop. Many talks are mediocre because they sputter to a halt with no warning, leaving the audience with a dissatisfied, puzzled look. One of the most anticlimactic statements you can utter

is “Well, I guess that’s all I have.” The end of the talk is your opportunity to sum up and emphasize the points you want people to take home. Recap your three to five main points, and tell people how to use them.

Another technique is to leave your audience with something extra to think about. You could finish by saying, “We’ve covered a lot of material today, but believe it or not there’s more. Consider this . . .” Take time to script and rehearse a strong, emotional concluding statement that leaves your audience with a vivid mental image.

Always end by saying, “Thank you.” If you do not cue your audience to the end, they may be confused (or annoyed). The social ritual of thanks, followed by applause, gives finality to your talk and comforts everyone. A question period may follow, but ensure a proper closure before starting the questions (see the section titled “Rule #9: Set the ground rules”).

Rule #4: Know your beginning

After you have developed your ending, go back to the beginning. Giving a talk is like flying an airplane—the most difficult times are the takeoff and the landing. The rest of the time you should be on autopilot.

Start by introducing yourself, even if you have just been introduced. People are getting settled in and may have missed what someone said about you. Do not hesitate to tell people who you are, where you are from, and why you are giving this talk. It takes less than a minute and lets your audience see your confidence right from the beginning.

Memorize your opening, but not the whole talk. If you learn by rote the spiel for the first few slides, you will get a smooth start no matter how anxious or tired you are. It gives your nerves a chance to settle before you go into the autopilot portion of your talk. (If you do not feel that you can comfortably get to this state, see the section titled “Rule #10: Getting over stage fright.”)

Tell the audience up front why they need to pay attention and why your talk is important to them; for example, “I will give you the information you need to help prevent contrast-induced nephropathy in your patient” or “I will tell you about the injury that is the number one cause of successful litigation against emergency physicians.” If you have not grabbed your listener’s attention in the first few minutes, you may never do so later.

It is perfectly okay—and even encouraged—to give the conclusion at the beginning. Your audience hears it once at the beginning, a second time when you are in the middle of your talk, and a third time as you finish. You should even think about saying it a fourth time.

Rule #5: Know your material

You have heard the statement before, and I will verify it for you: the best way to learn a subject is to teach it. Whether you tutor a group of emergency medical technicians at a local fire station or give a keynote presentation at an international gathering of hundreds or thousands, that principle stays the same. No matter how good your presentation skills may be, you will come up short if you do not know your topic backwards and forwards, and sideways.

Anyone can read a bunch of slides. As an educator to be remembered, you must know your material well enough so that you can change things “on the fly,” depending on the reactions from your audience. You can ad-lib and improvise to meet the needs of your viewers as you see their responses: blank stares cause you to rephrase a statement and puzzled looks encourage you to find out where more edification is needed. You are part editor, part director, and part actor. Rather than “lecture,” you are involved in a running conversation with your listeners.

While preparing your talk, you will predictably learn something new about your subject. When you pass on that information to your audience, your enthusiasm will be apparent.

Rule #6: Pay attention to your voice and tone

Quiet and dull never sold anything; your audience will not learn a thing if they are asleep. Talk just a little louder than you think is necessary. At first you will sound loud to yourself, but the audience interprets this as enthusiasm and authority. Your volume and projection must match your physical appearance or you will not look and/or sound correct.

When starting, do not ask, “Can everybody hear me?” Rather, ask, “Do I need to speak louder?” If somebody cannot hear you, they cannot answer your question.

While a bad speaker talks at the same speed, volume, and intensity throughout, a good speaker has a cadence and a volume that varies with the subject matter (odds ratio for falling asleep during a talk by monotone presenter: 6.8) [4]. A good speaker emphasizes important words and ideas by speaking even louder, by using a slow and deliberate voice, or by repeating a key concept. While we have been conditioned to think that silence (“dead air”) is bad, a few seconds of quiet before and after a key point can drive it home effectively.

Organized communication comes from an organized mind. Give yourself permission to take as long as you need to develop what you will say next. You know the material, so trust yourself: stop thinking after you start a sentence. A poor speaker frequently rethinks a sentence once it is started, and what comes out is confused and uneven.

When you do not know what to say next, be quiet: the audience is not going anywhere. You have a right to remain silent. You can even repeat the last thing you said in an effort to jog your memory; your audience will hear it as emphasis on whatever point you have just made.

It is not vanity to listen to yourself speak: it is essential. You will be your own most astute critic, picking up annoying tics and quirks you would never discover otherwise. Record and listen to yourself every chance you get. Count the number of times you start a sentence with “So . . .,” “By the way . . .,” or “Basically . . .” Then count the number of times you end a sentence with “Okay?” as a question. You may be chagrined by your findings.

Practice pronouncing final syllables, and make sure that you form final consonants distinctly. Overdo it because a large percentage of the population may have a hearing defect, think of them when you practice.

Many years ago when I was a radio announcer, I was aghast when I first listened to my airchecks. I heard a “small market inflection,” a slight upward inflection of the words at the end of a sentence, intended to avoid monotone. You still hear it on most local community and college stations. As a polished speaker, you will avoid this vocal quirk.

Another thing I learned from radio is the “audience of one” technique. When you are sitting in a studio by yourself and speaking into a microphone, you try to speak to one person. You can translate this second-person singular technique to a roomful of people, but it takes practice. Rather than saying, “How many people use bedside ultrasound during the secondary trauma survey exams?” try saying, “Do you use bedside ultrasound during the secondary trauma survey exams?” It is a far more personable way to connect with your listeners, as each person in the room hears the question as an individual rather than as a member of a crowd. Each time you ask a rhetorical question, look at one individual and phrase it to him or her. It takes some practice, but is a very powerful tool.

Rule #7: Know your body language

A much discussed study shows that students can accurately predict a teacher’s ability to communicate effectively after watching a 30-s video clip of that teacher—with the sound turned off [5]. Even good teachers are not cognizant of how their body language and vocal nuances affect an audience’s reception.

Fixing nonverbal behavior is not easy, and it is almost impossible to fix as you speak. You must concentrate on it during rehearsal. Slow down all your motions; concentrate on moving only one part of your body at a time very deliberately. Speaking is performance, and

as a performance artist, you should be aware of where your body is every minute. There is an athleticism and grace transmitted by the best speakers. It comes with practice.

Just as we get most of the information we retain from our visual sense, our strongest impressions of a speaker are often visual impressions. A gesture, whether intended or not, is apt to have as great an effect on listeners as the words you are speaking. Make relevant, productive gestures or make none at all. Use your hands to make natural gestures, just as in normal conversation, but make them broader. Small gestures look tentative and uncertain when you are in front of a group. When you are not using your hands, keep them by your side. The fig-leaf position, with hands clasped in front of you, looks defensive and gives the impression that you are apprehensive and lack certainty. It is okay to put your hands in your pockets occasionally, but do not keep them there for long because this impairs your ability to gesture naturally, and you will be tempted to play with keys, coins, or other items your hands may find.

Stand with your feet slightly apart—no more than the width of your shoulders. If your feet are too far apart, you will look confrontational. If your feet are too close together, you will look stiff and nervous, like you are standing at attention.

Facial expression is startlingly important. It has been reported that 7% of meaning is in the words that are spoken; 38%, in the way the words are said; and 55%, in facial expression, although this rule has been disputed [6]. Enthusiasm is contagious. Let your audience know that you are committed to your ideas and excited about them; they will not only *hear* your enthusiasm, but they will *see* it in your body language and they also will feel it then.

Rule #8: Know your environment

If you speak in a room with a podium, ignore it except to avoid bumping into it or tripping over it. Move around the room. Make eye contact with everyone in the room at least twice during your talk. If the group is small, do it even more frequently. If there is a sturdy table, sit on it briefly. Your audience will be more comfortable with you if you seem comfortable with them. Movement gives the audience the impression that you are talking with them rather than at them.

If you are provided with a laser pointer, be very, very careful. I recommend not using it at all. Invest in an old-fashioned telescoping pointer. Think about the ways you have seen laser pointers used. Speakers have a tendency to “circle” items on their slides rather than point, and you have absolutely no idea what they want you to see. Do you still run your finger under the text when you read? If not, do not make your audience do it. Put the laser down and no one will get hurt.

If there is something you want to highlight, hold the laser light steady. But remember, every time you face the screen to use a laser pointer, you turn your back on your audience.

Rule #9: Set the ground rules

Tell your audience how you will spend their time, and define how you will accept questions. Then leave time at the end to answer those questions. Sometimes the hardest part is getting the first question, especially in a large audience where no one wants to be first. Break the ice by asking an easy “conversational” question related to your subject. Once the first audience member speaks, others will follow.

With an audience of 30 people or more, you should repeat a question so everyone knows exactly what question you are answering. This also gives you valuable time to think. You do not have to repeat the question verbatim, but make sure you restate the essential elements.

Avoid saying, “What a great question!” It often means, “I have an answer prepared for that,” or it implies that other questions maybe were not so great.

Look directly at the person who is asking you the question and make sure they are finished before you start your answer. Talk to the entire audience during your answer. If you direct your attention only to the questioner, you will lose the interest of the rest of your audience.

Finally, tell the audience when you are wrapping up: announce that you have time for only one more question. Be specific.

Another tactic is to finish the body of the lecture, announce that you will take a few questions, and then summarize the main points of your talk. That method allows you to conclude with a powerful finish and walk away to applause. Do not let the question session be anticlimactic, occurring while most of your audience is getting up to leave.

Rule #10: Deal with stage fright

When you suffer an attack of nerves you’re being attacked by the nervous system.

What chance has a man got against a system?

—Russell Hoban

Although stage fright means many things to many people, the most common symptoms are dry mouth; tight throat; sweaty, cold, or shaky hands; nausea; tachycardia; shaky knees; and trembling lips [7]. As per DSM-IV, many of these are identical to features of anxiety and panic attacks.

Think of fear as your friend. When you are nervous about speaking, you will be more conscious of your posture and breathing. Excess epinephrine heightens your energy, dilates your pupils, and improves

your reflexes. These side effects actually make you look healthier and more physically attractive.

The trickiest time is before your start. If you know your material, the stage fright goes away once you start speaking. How many times have you complimented someone on a job well done and found out afterward that they were extremely nervous? Remember that nervousness does not show one-tenth as much as it feels.

Not everyone reacts the same to stage fright; there is also no universal guaranteed fix for it. Many techniques are recommended by many public speakers; you may need to experiment to find the ones right for you. First and foremost, stay in shape; public speaking is an athletic endeavor. Arrive at the site where you will speak early enough to find out where everything is located in the room. Engage in conversation with attendees, and intently listen to what they are saying. If you speak from notes, hide cartoons or pictures of your children (or grandchildren) in the papers. Use eye contact so you feel less isolated. Find the friendliest faces in the audience and talk to them until you relax. You can even joke about your nervousness.

Now that you have got it all together: practice, practice, practice

Amateurs practice until they get it right; professionals practice until they cannot get it wrong. There are very few people who are “naturals” when it comes to public speaking. Speaking is just like tennis or golf; it is a physical activity that requires hard work and a lot of practice. Just like your golf or tennis game, your speaking style will suffer with inactivity: use it or lose it. Speaking opportunities are abundant, so start speaking every chance you get. Volunteer to speak at local hospitals, fire stations, service organizations, nursing schools—the opportunities are unlimited.

Rehearsal is much more than going through the presentation time after time; it is preparation time that simulates the actual speaking conditions as closely as possible. Plan how you will verbally emphasize key phrases and ideas, especially points that you are going to repeat. Do not try to rehearse specific gestures, as they invariably come across as phony.

Rehearsal means speaking out loud. Internal language is different from spoken language, and merely reciting the material to yourself is not an effective method of rehearsal. Herman Hesse said, “Everything becomes a little different as soon as it is spoken out loud.” Suddenly the redundancies, the uneven flow, and the unclear conclusions

reveal themselves. Internal language is silent and grammatically and semantically condensed [8].

Feedback from an audience knowledgeable about your topic is also helpful, but not always available. Receiving feedback is tricky, and you may want to prepare your test audience by asking them to relate both good and bad things about your talk. Feedback should be specific and should focus on things that you can change. To receive feedback, you must be receptive to it. No one likes criticism because it always hurts at least a little bit. But think about how, or whether, to incorporate this feedback into improving your style or presentation.

Nothing can take the place of recording and listening to your practice sessions. Get a tape recorder or MP3 recorder or figure out how to use the recording function on your computer or PDA. First go through your talk without an audience, speak in a normal conversational voice into the recording device, and then listen: you will learn a lot from this first playback. Then do a second run-through; this time concentrate on staying close to your time limit and on making smooth transitions from one point to the next. On your third recording, have at least one other person in the room, stand up, and speak loudly and clearly just as you will in the actual situation.

Complete your final practice session before the day of your presentation. You will get virtually no benefit from last-minute practice. Instead, use the few hours just before you speak to reflect on the concepts and the major theme of your presentation.

Conclusion

Being a good presenter is not a one-time event. Review a recording every few months to check your progress. Listen to good speakers every chance you get, whether in person or from commercial continuing medical education programs. Then listen again and concentrate on what makes that speaker effective—the voice, enthusiasm, mannerisms, and ability to put across motivating ideas.

There is no unique model for a successful speaker. Your personal style of public speaking may not be the same as that of anybody you know. The yardstick for a good presenter is simply the effectiveness in getting the message across.

To speak like an expert, get up there and say something that will make your audience lose track of time and forget everything else in the world except what you are telling them. Every appearance must be your best, as it might be the last thing people remember about you.

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CHAPTER 22

Small-group discussion skills

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Discussions in a small-group setting are remarkably effective educational techniques commonly used in medical educational curricula. The learning process is active rather than passive. Successful in many different settings, small-group discussions are likely to occur, for example, on change-of-shift rounds, while teaching advanced cardiac life support, and during simulation training, and they can even replace some formal didactic sessions. A large group can be divided to accomplish the goals and gain the advantage of small-group discussions. The key to a valuable small-group discussion is just that—making it a discussion. The effective leader functions as a facilitator, encouraging learners to actively come up with their own answers.

Small-group discussions give the student the opportunity to be more involved in learning, thus increasing retention. Studies show that an active learner is a more effective learner and the chances of retention are much higher [1, 2]. The trade-off is that less material can be covered in the same amount of time using this educational technique compared with lecture. However, as the student is forced to discuss and conceptualize the topic, a deeper and more permanent understanding develops. Research also shows that group interaction stimulates student learning and improves long-term retention by integrating new information with existing knowledge [3, 4].

The continuum of learning begins with basic knowledge and comprehension and then progresses through application, analysis, synthesis, and evaluation [3]. Small-group discussions allow the trainee to use these higher levels of learning [5]. Studies have shown that discussion of a topic in a small-group setting facilitates learning regardless of whether it occurs before or after reading the topic from a text [6]. Basic knowledge and comprehension are best taught in a lecture format or through assigned reading before a discussion. The discussion format then excels at the later processes, which are essential in the training of a physician.

One of the biggest gains during this dynamic process comes from interactions with others. Here, trainees learn to think critically on their feet while discussing ideas and absorbing input from multiple sources to come up with a plan. In addition to the learner's increase in medical knowledge, interpersonal and communication skills are improved as the group works together. These skills are invaluable to the learners as they progress through their training, specifically in the emergency department.

Opportunities for use of small groups

In emergency medicine, small groups are beneficial for almost any educational objective. To be successful, enough time and space must be allotted for a small-group session to proceed naturally. A large contingent of faculty members might be required to assist with each session. Some of the most effective scenarios are listed in the following sections.

Approach to a clinical problem

A systematic approach to and pattern recognition of a patient complaint is the essence of the practice of emergency medicine and must be taught to our trainees. A large-group lecture or textbook readings can give the basic facts about a disease, but a small-group discussion works much better for describing the cognitive process that an expert uses to identify a differential diagnosis and direct the ED evaluation of a patient. For a patient with dyspnea, for example, an effective facilitator can lead the group through a review of the laboratory and radiologic testing that is necessary to narrow down the possible causes.

Developing a skill set

A small-group discussion is an excellent way to reinforce information provided in an initial overview given by lecture or assigned reading.

One example is the development of the skills needed to read electrocardiograms. After basic knowledge has been provided, interaction time with an instructor can be spent in discussion and answering questions rather than passing on rote facts.

Teaching procedures

The best way to teach a procedure is usually in a small-group setting. An important aspect of demonstrating a procedure is allowing each learner to see the appropriate anatomic landmarks and each piece of equipment while its use is explained. For instance, in learning how to place a central line, a small group of trainees can observe and discuss each step around a model more effectively than during a lecture with slides. Having a senior house officer as the group leader who teaches the procedure and leads the discussion will reinforce the procedural skills also for this more experienced trainee.

Literature review

Breakout sessions can be used at a journal club or literature review session and can be organized according to the level of understanding of each group. The entire training program can discuss articles as a large group, noting global strengths and weaknesses. Then the house officers can be divided into smaller groups based on the education level to concentrate on specific skills (e.g., basic statistics). The involvement of every member of the group creates a more meaningful and active learning environment.

Types of small groups

Learners around the globe use many types of small groups. Some are described in other chapters in this book, including those outside the typical classroom such as simulation and bedside teaching. Even a lecture for a large group can be turned into a small-group discussion by having paired discussions (learners turning to each other to briefly discuss one topic). Other types of small groups are described in the following sections.

Case-based learning

Individual cases can be used to practice the concept of small-group discussion. The description of a case or cases, with associated questions, can be distributed in advance of the discussion. All the learners develop their own answers before meeting, allowing time for those having less background knowledge of the topic to preview the subject matter. Then the case is discussed in the small group. This is particularly appropriate for students and junior house officers.

Role-playing

Role-playing is useful in evaluating a trainee's ability to communicate effectively in difficult cases. Typically, a case is presented to a group of learners and one member of the group acts as the patient. This is most effective when the story has been developed in advance and the person acting as the patient understands his or her role before starting. Frequently practiced scenarios are giving bad news, dealing with an angry parent, or calming an agitated psychiatric patient. The role-playing and subsequent small-group discussion give trainees opportunities to work through critical and stressful situations in their minds before being overwhelmed in the emergency department. This can be a powerful tool for determining competency in areas that have less objective evaluation techniques (e.g., communication skills).

Problem-based learning

Problem-based learning is used frequently in the US medical school education. It is different from simple small-group discussions in that participants are encouraged to use self-directed learning skills [7]. The student is responsible for deciding what needs to be learned and then learning it [5]. This is performed in a group setting, where an open-ended clinical scenario is proposed. The students analyze it, formulating and prioritizing key learning objectives. They then disband to collect the needed information and regroup several days later to discuss the findings [7]. This interaction gives the learners a sense of ownership of the new knowledge.

Team-based learning

Team-based learning (TBL) is another variation of small-group discussions that is becoming popular in medical education throughout the world [8–11]. TBL encompasses three components: preparation, assessment, and problem solving. One large class is divided into smaller diverse groups of five to seven students. Each participant is expected to prepare by completing readings before class. Next, a 10-item multiple-choice readiness assessment test (RAT) is given to each person individually and then to the group. The grade for the project should include the individual's RAT score to ensure that he or she prepared for the group discussion. Groups can appeal wrong answers and the instructor can educate where clarification is needed. Finally, each group works on the same problems simultaneously, posting the answers at the same time for the other groups to discuss. The most difficult, yet important, part of TBL for the instructor is preparing questions that are difficult and vague enough to generate discussion but that still have a discrete answer. This methodology enjoys all the benefits of a small-group discussion yet is faculty sparing.

Learners tend to express genuine excitement and become actively engaged, thereby advancing in their problem-solving skills as a team.

Characteristics and techniques of a good facilitator

Facilitator characteristics

A skilled facilitator is necessary to achieve the discussion objectives and maintain cohesion of the small group during the task (Table 22.1) [5]. Discussions, by nature, are unpredictable, so a good facilitator must be spontaneous and creative [3]. Being comfortable with ambiguity and differing opinions helps, along with having a good sense of humor.

Enthusiasm for learning and respect for the learner are also necessary traits for a facilitator. Learners clearly respond better to faculty members who are approachable and appear interested. Trainees look up to someone who is knowledgeable, a good clinician, and confident in his or her clinical skills. At the same time, students clearly appreciate faculty who can acknowledge when they do not know the answer [12, 13]. This facilitates discussion, as the group looks up the information together.

Techniques

Preparation

Some successful lecturers perform poorly as discussion facilitators because they do not understand the unique preparation and techniques required in this learning environment [3]. The faculty leader must first believe that the small-group discussion is a valid and powerful teaching method. Preparation time is similar to organizing a lecture. Along with gathering necessary material, the learners' knowledge base must be assessed and specific goals for the session need to

Table 22.1 Characteristics of a good small-group facilitator.

- Spontaneous and creative
- Comfortable with ambiguity
- Good sense of humor
- Enthusiasm for learning
- Approachable
- Possesses solid clinical knowledge
- Can acknowledge limitations

be defined clearly. It is important for the facilitator to remember that not as much detail can be covered in a group discussion as in lecture. Without planning for a discussion, an urgency to cover all the material develops and, instead of allowing the free exchange of ideas and deeper learning, many teachers revert to the classic lecture format [14].

Restraint

The facilitator will likely have the answer that the group is looking for, but providing this knowledge defeats the purpose of the group discussion. In fact, an effective facilitator need not be a content expert, as an energetic leader with an understanding of the group interactions is more valuable than a less dynamic leader with medical proficiency in the subject [7]. Having expertise in the particular topic may even be disadvantageous to the group, as one might have a tendency to return to lecture mode. Still, the faculty member may want to interject an occasional, thoughtful personal experience for everyone's learning and to generate further discussion.

Questioning

A facilitator uses questions for three reasons: to initiate discussion, to encourage participation, and to keep the discussion on track [3]. Questions can be open or closed, but they always need to be specific. Open questions will broaden a topic, while closed questions are used to drill down on a specific idea. Showing enthusiasm for all answers, not just the correct ones, will increase participation. The leader must be comfortable with silence and not pass a question onto another student until there has been plenty of time to ponder the answer. Questions from group members directed to the leader should be put back out to the group.

Summarizing

Summarization is used to emphasize every major topic and regain the group's focus. The summary is a brief statement that includes comments made by multiple group members. By creating a rhythm of questions and answers, with frequent summarization, the facilitator can lead the group to achieve "moments of greater understanding" [3].

Brainstorming

The key to brainstorming is to hold judgment until after all ideas are generated. Encourage the learners to improve on their ideas by combining and building on them. Time is allotted afterward for

evaluation. In emergency medicine, this is commonly used to develop a differential diagnosis in a case-based learning scenario.

Adjusting tension level

All verbal interactions are associated with a certain tone, level of tension, or ambience [3]. The moderator's goal is to keep the group at a moderate tone. If the atmosphere is too stressful, then group members will feel inhibited and might be reluctant to contribute. If the mood is too lenient, then the discussion can become too casual and unproductive. The tenor in professional settings is usually too high, so the moderator should approach the discussion with a comfortable, conversational tone [3]. Preparation is paramount to being able to actively adjust the tone of a group.

Starting a small-group discussion

Establish goals

Before organizing small-group discussions, define goals for the educational exercises (Table 22.2). This will likely include learning objectives with specific key points of knowledge, for example, the treatment protocols for acute asthma. The group members must understand that active participation of all members is required.

Size the group for discussion

Give some forethought to how the group should be organized to accomplish the established goals. Groups of five to eight people seem to be ideal for most small-group discussions in emergency medicine. A larger group can be broken into smaller segments for discussion. If a larger group is kept together, a clear facilitation plan is needed so everyone has an equal opportunity to contribute.

Choose a seating arrangement

The seating arrangement is directly related to how the individual will participate. Each member of the group must be in a position to see everyone else. A circular table or a cluster of chairs would allow this view of the group better than a rectangular table. The group can assemble in pairs around a circle for one-on-one discussion or role play. A larger group could have an inner circle of participants who discuss a topic while an outer circle of participants listen [14]. To avoid returning to lecturing format, the facilitator should not be at the focal point of the group. He or she should sit in the group as one of the members or consider a position that allows wandering away from the group at times, returning long enough to ensure the group is still on task.

Table 22.2 Techniques for success.

- 1 Determine the type of small group
 - Opportunities exist in teaching procedures and skill sets, discussing cases, practicing oral boards, reviewing articles at breakout sessions, role-playing scenarios, and working through simulations.
- 2 Establish goals
 - Define specific points of learning, including the importance of teamwork.
- 3 Size the group
 - Decide the number of participants based on the type of small group.
 - Break up a large group into smaller segments as appropriate.
- 4 Arrange seating
 - Allow everyone to see each other.
 - The facilitator should not sit in a lead position.
- 5 Select materials
 - Readings can be given for individual review before the discussion.
 - Material used in the discussion must be challenging enough to generate a conversation, yet simple enough to cover in the allotted time.
- 6 Set the expectations
 - Everyone must contribute.
 - The evaluation process should be transparent.
 - Encouragement and praise should always dominate constructive criticism.
- 7 Facilitate the discussion
 - Avoid lecturing.
 - Stay enthusiastic and approachable.
 - Pause before contributing to allow students to speak first.
- 8 Ensure equal contributions
 - Check individual preparation where appropriate.
 - Call on specific people by name to add a comment as needed.
- 9 Stay on task
 - Prepare ahead of time.
 - Knowing what is to be covered will help redirect the discussion if the group moves off course.
 - Realize that less material will be covered than in a lecture format, but the retention is higher.
- 10 Assess the discussion
 - Trainees may be evaluated on preparation, participation, and performance.
 - The group leader should receive feedback to enhance facilitation skills.

Select materials

The instructor must determine which materials should be distributed before the session for the students to review. Small-group discussions are not a good place to introduce new knowledge; therefore, a chapter from a textbook, a set of journal articles, or case summaries may need to be assigned before the discussion. Literature review articles should be chosen based on the learners' academic interest and

their ability to generate discussion. A formal lecture could precede the discussion. The appropriate material and format depend on the type of small-group session that is planned.

At times, it will be appropriate to hold the materials until the start of the discussion. Oral examination cases are a good example. After one learner works through a case, the group then discusses the specific clinical situation. Case-based scenarios are usually given in advance but can be held until the discussion. In all cases, the level of difficulty must be challenging enough to keep everyone's interest while being simple enough to cover in one sitting.

Set rules and expectations

It is important that everyone is aware of what is expected of each member of the group. If background material is distributed before the session, each trainee needs to come prepared to discuss it. Each person is expected to contribute to the discussion. During the initial session, it must be made clear that people need to be given the opportunity to express their opinions without interruption and that critical comments should be kept to a minimum. Encouragement and praise for something said or done well should precede constructive criticism. Everyone needs to be aware of the evaluation process from the beginning. The allotted time should be clearly defined, with a set start and an end time.

Challenges of small-group discussions and their solutions

Keeping the small group in discussion

There is a tendency in small-group discussions for the facilitator to talk too much and convert the experience into a lecture. This can be minimized by principles discussed earlier. In particular, adequate preparation, proper seating, and specific questions with a tolerance for silence will help keep the group in a discussion.

Getting everyone to participate

If material needs to be reviewed before the discussion, then the members of the group should hold individuals accountable for preparation. The faculty member can accomplish this by having all participants show their notes or by giving a small quiz. An innovative testing approach is to use scratch-off answer sheets, called the *Immediate Feedback Assessment Technique (IF-AT)*, which requires each group member to commit to an answer and then allows discussion to flow around why some answers might be incorrect [15]. Some members

may seem shy and not participate as much, so a skillful facilitator must call on individuals by name for their opinion to engage them in the group discussion. Strong positive reinforcement is most important with those who contribute the least.

Prevent one participant from dominating the discussion

While a dominant person may or may not have good intentions, he or she must be reminded that this is a discussion. Starting with subtle reminders by asking others to voice their opinions, the facilitator can refer back to this person only after other members of the group have spoken. If there is still a problem, the group leader can thank the individual for his or her input but then should gently ask that he or she gives others a chance to contribute first. Alternately, the moderator can cut across the individual's talk with a summarizing statement and then direct a question to another student.

Stay on task

The facilitator must keep the topic clear and the discussion focused. Some side discussion may be beneficial, especially as the group delves deeper into an aspect of the topic that interests them. If the facilitator sees that the group is moving off course completely, then it is up to him or her to bring the group back on topic. Summarizing what has been covered so far and bringing up the next question for the group to discuss will usually get the discussion back on course.

Assessing the discussion

An important aspect of a successful small-group discussion is assessment. In evaluating the student, a faculty member should focus on knowledge transfer, not solely on the correct answer. This may be only an oral assessment, but it is important that the student receives this feedback. Receiving immediate feedback will solidify key concepts and reinforce the individual's strengths and weaknesses as a participant in a group.

Individually, students can be evaluated on preparation, participation, and performance. Preparation can be assessed by something as simple as asking if the assigned reading was complete or as formal as a quiz before the discussion to ensure that the required reading was completed.

Participation can be assessed by keeping track of who contributes to the discussion. If lack of participation is a general problem, individual involvement should be documented. Having the trainees rate each other's level of participation at the end of a discussion is another

powerful assessment tool. This peer feedback is an excellent summary to include in a house officer's educational portfolio or file.

Performance is the final part of the student's assessment. This looks more at individual answers given by the learner. Performance may also include the student's use of insightful questions and ability to bring up additional points of discussion.

Feedback for facilitator performance can be instantaneous at the session or part of the overall faculty evaluation. Either way, it is important for the faculty member to receive feedback on what he or she does well as a facilitator and what needs to be improved. Feedback should include the ability to keep the discussion flowing smoothly, along with the characteristics and techniques reviewed earlier.

Conclusion

The small-group discussion is an effective educational teaching tool in many environments. Participation in the learning process can increase interest and retention in a subject area. Useful for in-depth discussions of previously taught concepts, the small-group discussion can provide a setting for reflective questioning and critical thinking. One of the most important aspects of a successful small group is the preparation and skill of the facilitator, who moves the discussion along while allowing all members equal opportunity to participate. With the proper groundwork, enthusiastic learner participation, and helpful feedback at the end of the session, small-group discussions can become the favorite learning mode of a program's learners and teachers.

Summary points

- 1 Small groups allow in-depth discussion of a topic.
- 2 A key to success is a prepared and skilled facilitator.
- 3 Enthusiastic participation by learners increases the small group's effectiveness.

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CHAPTER 23

Faculty development as a guide to becoming a better teacher

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This chapter focuses on faculty development programs and resources that help faculty members develop the skills and abilities needed for (i) effective and efficient clinical teaching in formal didactic and clinical settings, (ii) customizing a comprehensive faculty development program to enhance clinical teaching, (iii) engaging in necessary scholarly activity, and (iv) documenting expertise and productivity in teaching for purposes of promotion.

One of the most exciting recent developments in professional education is the movement toward the recognition of “master teachers.” These are teachers who are highly trained and competent in the broad skill sets needed to effectively teach in rapidly changing educational environments. The development of this concept stems from recognizing the vital role of clinician–educators in various academic settings and the need for these teachers to have a deep understanding of how to teach, which goes far beyond having “content expertise” in medicine. Master teachers are physicians with expertise in multiple areas of clinical medical education, who engage in faculty development throughout their careers, and whose achievements are evaluated with revised definitions of scholarship and tenure criteria [1, 2].

The terminology used to describe medical faculty is evolving. The variety of terms, for example, clinician–teacher, clinician–educator, voluntary faculty, paid faculty, and affiliated faculty, reflects the need for clinicians to teach in various capacities, with variable amounts of time available for academics.

This chapter uses the term *core faculty* as defined by the Residency Review Committee (RRC) of the Accreditation Council for Graduate Medical Education (ACGME) to refer to faculty members who devote their careers to academics [3]. Emergency medicine program requirements state, “A core faculty member, a member of the program faculty, is one who provides clinical service and teaching, devotes the majority of his or her professional efforts to the program, and has sufficient time protected from direct service responsibilities to meet the educational requirements of the program.” The RRC’s emergency medicine requirements also state, “at minimum, 80% of individual core faculty members should demonstrate at least one piece of scholarly activity per year, averaged over the previous [5-year] period.” This requirement applies to faculty members who wish to devote their main efforts to academics, in contrast to teaching clinicians who devote their main efforts to patient care and teach primarily in clinical settings through bedside teaching and supervision. Some core faculty members will indeed become master teachers, and some teaching clinicians might aspire to become core faculty and progress to the master teacher level at some point in their careers.

Faculty development has multiple definitions and approaches regarding the content and format of programs designed for it. One of the reasons for the multiplicity of approaches is that individual faculty members’ needs differ depending on their duties, knowledge, experience, and goals. Variability also exists regarding the needs of the departments and institutions where they work. Finally, as careers advance, goals change. These factors all result in the need for customization of the overall plan for faculty development. For these reasons, the term *faculty development*, frequently called *professional development*, has been changed to *continual professional learning* to emphasize the ongoing need for faculty to expand their knowledge and capabilities through lifelong learning [2].

Definitions of faculty development

The purpose of early faculty development programs or “teacher training” was to prepare faculty to teach, which was their primary responsibility at that time [4]. Since those early programs, faculty development has expanded as the roles and duties of medical education faculty, especially clinicians who are making a career of academic medicine, have stretched beyond teaching to include research and administrative duties.

Faculty development has been described in various ways: as a “continuous training process, whereby the creativity, productivity, and longevity of faculty members [are] improved” [5], as “a planned

program designed to prepare institutions and faculty members for their various roles” [6], as any planned activity to improve an individual’s knowledge and skills in areas considered essential to the performance of a faculty member in a department or a residency program (e.g., teaching skills, administrative skills, research skills, clinical skills)” [7], and as programs that provide the intellectual tools and skills to assist faculty members in accomplishing their academic goals [8]. On the basis of these definitions, few formal faculty development programs, such as fellowships and curricula leading to degrees, are limited to the subject of how to teach. Teaching clinicians interested in improving their teaching skills will find that much of their education in teaching will come from their departments and institutions, independent learning using printed and online resources, and presentations at professional meetings.

The term *competency* is used to describe either what an individual should be able to do to perform the duties of a job or what knowledge, skills, and attitudes will be acquired as a result of training [9]. Both definitions are of value, as the first describes the duties of teaching clinicians and core faculty and the second describes faculty development programs and independent learning. The expectations of clinician-teachers, including faculty members who want to teach only in the clinical setting and those who want to make academics their primary focus, are expanding, so an examination of the skills and duties expected of all clinicians who teach is a valuable endeavor.

Practicing in an academic setting

Some academic environments, usually in community hospitals, have two types of faculty members: (i) physicians who want to spend most of their time in clinical practice, do some bedside teaching and supervise physicians in training, and deliver an occasional formal teaching presentation and (ii) those who aspire to become core faculty, with the requirements that they teach, engage in scholarly activity, and provide service to their institution and specialty. Other academic environments, often in university settings, require that all faculty members fulfill the obligations of teaching, scholarly activity (defined by many universities as research), and service. It is critical for young faculty to decide the type of environment they wish to practice, as this decision will drive the type of faculty development they need and the kinds of activities they engage.

Excellence in teaching is not enough for success or promotion in a university setting. Faculty members must demonstrate scholarly activity. Although, on the surface, all universities and medical schools seem similar in their requirements, they vary widely in how they

define and value various activities and the amount and types of activities that are acceptable to ensure promotion. The culture of the institution drives these value systems. A faculty member who wants to practice clinical medicine and teach will not do well in an environment and culture that emphasizes and values research and acquisition of grants to support that research. Fortunately, the university culture is slowly changing: the definition of “scholarly activity” is being broadened beyond “discovery of new knowledge” as medical school deans realize that they need clinicians to teach medical students and residents and to provide clinically generated revenues to support the school [10, 11].

Community-based teaching programs put much less emphasis on research and scholarly activity. But even in these community settings, core faculty must engage in scholarly activity to satisfy the program requirements of creating a scholarly learning environment for residents, delivering a well-designed curriculum, and teaching effectively as well as to fulfill the requirements of RRCs for faculty scholarship. For further details, see the ACGME website [3]. For all these reasons, faculty development programs have a diversity of goals and teach many topics in addition to “how to teach.”

Necessary knowledge and skills

A survey of junior faculty members in emergency medicine revealed a perceived need for and a deficiency of training in the teaching-related topics listed in Table 23.1 [12].

All faculty practicing in USA in programs accredited by the ACGME need to know the ACGME’s General Competencies in order to teach

Table 23.1 Self-perceived faculty development needs for teaching.

Bedside teaching
Lecture development
Presentations
Medical simulation
Evidence-based medicine
Use of technology in education
Curriculum design and development
Evaluation

Adapted from [12] Farley H, Casaletto J, Ankel F, et al. An assessment of the faculty development needs of junior clinical faculty in emergency medicine. *Acad Emerg Med* 2008; 15: 664–668 by permission of John Wiley and Sons Ltd.

them and assess residents' abilities to practice them. The competencies are published at the ACGME website [3] along with information on how to teach and assess them. Faculty members must model these practices and behaviors so that residents can learn the expectations of the specialty of emergency medicine for practicing the core competencies. The Council of Emergency Medicine Residency Directors (CORD) published a series of reports that interpret the competencies for emergency medicine [13–18].

Clinicians as teachers

The expert clinical teacher needs a deep knowledge of the practice of emergency medicine, the desire to teach, and a willingness to learn how to teach. Personal attributes of teaching clinicians are extremely important and often determine the individual's success or failure in regard to teaching. Bedside teaching should encourage higher-order thinking in learners to help them develop their skills in analyzing and solving patient problems [19]. Competencies needed for effective clinical teaching are listed in Table 23.2.

Wilkerson and Irby [20] noted, "whereas it was once assumed that a competent basic or clinical scientist would naturally be an effective teacher, it is now acknowledged that preparation for teaching is essential." In the past, many teachers limited themselves to either bedside teaching or lecturing. Several articles offer practical suggestions on how exemplary teachers can teach in busy emergency departments [21] and other settings when time is short [22], how to supervise [23], and what emergency medicine learners value in their teachers [24].

Didactic teaching is required of all core faculty members. Lecturing remains a common method of formal didactic teaching. A recent trend emphasizes teaching strategies that foster "active learning." This approach encourages learners to construct meaning and develop their skills in solving clinical problems. Examples include small-group discussion, case-based teaching and learning, and team-based training [23, 25, 26].

Emergency physicians are branching out into high- and low-fidelity simulation and the use of multimedia. Widespread access to the Internet, improved technology, and lower costs encourage distance instruction, both in real time and asynchronously. Distance instruction is provided through webinars, websites that archive resources, and interactive learning modules for self-instruction. All these types of education allow emergency medicine faculty to find a niche for the development of expertise. The only requirement is to identify what you like to do so that you will devote the time and

Table 23.2 Recommended bedside teaching skills.

Listening to presentations and making suggestions on patient evaluation and treatment	Encouraging higher-order thinking by encouraging problem solving, critical thinking, self-assessment, and learner recognition of uncertainties and gaps in knowledge
Demonstrating history taking and physical examination techniques	Modeling the thinking process by verbalizing reasoning for obtaining specific information
Teaching procedures	Modeling actions if needed, allowing early learners to verbally rehearse actions before beginning a procedure, giving assistance if needed, and providing feedback as necessary
Providing feedback	Informing learners that they are being given feedback, integrating feedback into the discussion of "how the case went," allowing learners to discuss what they felt went well and what they would do differently on the next case, and providing your suggestions
	Providing assistance as needed to all learners regardless of experience
	Feedback given to residents and medical students during or after a case is valued by the learners
Assessing and evaluating performance	Observing performance in selected situations will allow more accurate and informed assessments
Teach and model the ACGME general competencies	Know, practice, and teach them

effort to becoming an expert. Formal courses, focused on teaching, are discussed in detail later.

Process for faculty development

In the ideal process for faculty development, the faculty member first finds a mentor (Chapter 4). This person can help the faculty member clarify goals and then perform a needs assessment, identifying gaps in knowledge, skills, and training. At this point, a search for faculty development resources should begin. As each portion of the faculty development plan is completed, the mentor can then assist the faculty member to evaluate the success of the plan. The next

step is to reassess changes in goals and plan future activities in professional development.

In reality, the process of faculty development is not usually as carefully planned as these listed steps would suggest. Goals and circumstances can change quickly or need modification. Still, keeping the process in mind can be very helpful, especially at the beginning of an academic career and at transition points. For many new faculty members, the immediate need is to “learn how to teach effectively.” The most important decision is whether a clinician wants to devote his or her main efforts to direct patient care, supervision, and bedside teaching, with occasional delivery of a didactic presentation (teaching clinicians), or whether he or she wants to broaden into a role as core faculty or master teacher.

Most faculty development programs have elements that include teaching, scholarly activity, and professional development because successful academic physicians need all these skills and knowledge. The goal of many university faculty development programs is to educate physicians who intend to specialize in medical education within the medical school setting [27].

Developing a customized program

Many medical educators, especially early in their careers, seek to construct a self-study program because they lack the time to engage in a structured program with a set curriculum and attendance requirements. Components of independent study include reading articles on teaching and attending lectures or workshops to gain “tips and pearls” from expert clinicians who teach and from educators who have made a career in academics. Constructing a customized “curriculum” results in a systematic approach to fill gaps in knowledge, gain necessary skills, and avoid redundancy. The course of study does not need to be extremely involved; at the very least, it should include techniques for bedside teaching, presenting lectures, facilitating small-group discussions, organizing procedural workshops, and mentoring. Other skills to be mastered include public speaking, making effective handouts and slides, and searching the literature, not only in the National Library of Medicine but also within the literature on education and psychology (for this, a librarian is an invaluable resource). A curriculum can be designed by reviewing formal faculty development programs and then selecting the areas of knowledge that pertain to bedside and didactic teaching. After compiling the customized curriculum, speak to the mentor for advice.

Two short courses that might appeal to aspiring medical educators are the Advanced Cardiac Life Support (ACLS) Course for Instructors and the Advanced Trauma Life Support (ATLS) Course for Instructors. Both courses are devoted to teaching strategies that are useful in various situations. The American College of Emergency Physicians (ACEP) and the Emergency Medicine Foundation sponsor a teaching fellowship that is longer than the aforementioned courses and requires the completion of a curriculum development project. CORD sponsors “Navigating the Academic Waters,” which includes presentations on bedside and didactic teaching. Brief details of these and some other appropriate courses are presented in Appendix 23.1.

Another method of learning is watching others. One approach is to attend lectures and concentrate on the speaker’s *teaching style* and *strategies* rather than on the content of the presentation. A number of questions should be asked about the speaker. How does the teacher get and maintain the attention of the audience? How is the content organized and how are complex topics explained clearly? What multimedia “props,” for example, images, videos, or sounds, are used? Do they add or detract from the overall presentation? What are the teacher’s attributes regarding public speaking? How are the voice and body used to teach? How are questions asked and answered? How does the teacher interact with the audience? How does the instructor manage time? Use the same analysis to decide what is not done well. Finally, determine what you can use and what you will discard from the strategies and style of the presentation. Determine what you can incorporate into your teaching as you develop your own style.

Finding resources

Professional societies

Joining a professional society is extremely valuable for networking, meeting and learning from colleagues with mutual interests, being given opportunities to engage in collaborative research, and serving in national committees. Professional societies have websites that provide information and online resources in faculty development, sponsor national meetings that offer faculty development, and sponsor interest groups and academies that recognize and support various faculty activities.

Membership in the Council of Residency Directors (CORD) is valuable for any clinician who wishes to do more than bedside teaching and supervision. This society is open to any educator in emergency medicine. The department chair or program director must submit the name of the faculty member he or she wishes to become a member of CORD and pay the small membership fee.

The stated purposes of CORD are

- to improve the quality of emergency care;
- to establish and maintain high standards of excellence in emergency medicine training programs;
- to enhance the quality of instruction in emergency medicine training programs;
- to improve communication between the faculty of emergency medicine training programs.

The faculty member has access to the CORD Listserv, where members discuss matters of education and which gives faculty access to a network of information and philosophy on a large number of educational subjects. This is the “oral wisdom” of educators in emergency medicine, who have a wealth of practical experience. Anyone can pose a question, and a broad number of topics are discussed. Membership in CORD is not necessary to attend the organization’s Academic Assembly, an annual faculty development program that provides a wealth of information on teaching, career development, and research. The Assembly has multiple tracks, including Navigating the Academic Waters, New Program Directors Course, and Best Practices, which include presentations and discussions of educational strategies. CORD recently partnered with the Association of American Medical Colleges (AAMC) to offer workshops and mentoring experiences in collaborative research. Through this program, participants can earn the Medical Education Research Certification granted by the AAMC. CORD also sponsors the Academy for Scholarship [28]. The CORD website (www.cordem.org) has a great deal of information on the resources and services that are available through the organization, announcements of upcoming meetings, and links to other sites.

The mission of the Society for Academic Emergency Medicine (SAEM) (www.saem.org) is “to lead the advancement of emergency care through education and research, advocacy, and professional development in academic emergency medicine.” This organization is open to all emergency medicine physicians involved in academics and does not require a letter of recommendation but does charge a membership fee. SAEM publishes the journal *Academic Emergency Medicine*, which contains articles on both education and clinical medicine. The journal recently added a feature titled Peer-Reviewed Lectures (PERLs). This section of the journal offers faculty the opportunity to submit video presentations and receive peer-review feedback. After acceptance for publication, the presentation will be available online to readers of the journal, and the author of the presentation will receive credit for a peer-reviewed publication.

SAEM sponsors a number of interest groups and academies. Joining an interest group (e.g., evidence-based medicine, simulation,

ultrasound, undergraduate education) can be very valuable for collaboration on research projects, receiving invitations to give presentations, or serving on national committees. It also sponsors a number of academies designed to support educational efforts by academy members. The Academy for Women in Academic Emergency Medicine (AWAEM) and the Clerkship Directors in Emergency Medicine (CDEM) are just two of a number of academies. SAEM holds an annual meeting in the spring that is devoted to research and faculty development.

The website of the ACEP has extensive information on faculty development resources. The AAMC and the ACGME also offer programs for faculty development and provide valuable resources on their websites.

Printed and online materials

The most common and convenient method of learning is independent study. Elements of this approach include printed and online materials. Many articles have been published on the topic of bedside teaching, which is probably the most valuable method of learning the practices and pitfalls of clinical medicine. Indeed, it is during residency training that medical students gain the skills and competencies that allow them to become independent medical practitioners. For this reason, it can be argued that becoming an expert bedside teacher is the most important skill to be obtained by any faculty member. Reading a selection of these articles, combined with experiential learning, or “on-the-job” training, can constitute a valuable customized curriculum for becoming an expert clinical teacher. In the past, educators relied on a wide variety of printed materials, including books, monographs, and journal articles, on teaching in the didactic and clinical settings. While these resources remain in use, they are now joined by information accessible through the Internet. The challenge in using online sources is not finding resources but finding *good* resources that will supply the information you need in a format you want within your budgeted time.

A place to begin a literature search is Medline/PubMed (www.ncbi.nlm.nih.gov/pubmed), sponsored by the National Library of Medicine and the National Institutes of Health. A librarian can help you refine your search so that you can find exactly what you need in regard to content and teaching methodologies. Librarians are experts in information technology and can (i) guide you to websites that have the type of information you need, (ii) educate you on the use of reference management software, and (iii) help you find and use online databases so that your search for information can extend beyond Medline searches. If you truly want to engage in scholarly activity, you need

to find and learn from an expert librarian, who will save you a great deal of time and help you find useful resources. Many medical school libraries give seminars on the use of online and printed resources as well as classes on the use of reference management software.

Several journals are devoted to medical education: *Academic Medicine*, *Medical Educator*, *Medical Researcher*, the *Journal of Graduate Medical Education*, and *Teaching and Learning in Medicine*. The *British Medical Journal* is another source of practical information. Specialty journals, including those in emergency medicine, also publish articles on teaching. The *Canadian Medical Association Journal* frequently runs articles on teaching and faculty development. A librarian can inform you of new journals and direct you to online resources, including “open-access” journals (meaning they do not charge a subscription fee).

Several authors who are renowned for writing on medical education are Howard Barrows, Georges Bordage, Kevin Eva, Jerome Kassirer, Geoffrey Norman, and Glenn Regehr. They write on a variety of topics, including how people learn, the psychology of clinical decision making, and case-based and problem-based learning.

The Internet is a wealth of information, much of it good and useful. The only way to find good material is to browse. Some useful search terms that can be used in Google or Google Scholar are *medical education*, *bedside teaching*, *lecturing*, *small-group teaching*, *adult learning*, and *faculty development*. Google Scholar is changing the manner in which a search can be conducted. Many libraries have access to Google Scholar, and librarians are experts in conducting searches.

Another useful online site is the one produced by the Best Evidence in Medical Education (BEME) Collaboration (www2.warwick.ac.uk/fac/med/beme/), which is a group of individuals and institutions committed to the promotion of best evidence medical education through

- the dissemination of information that allows medical teachers, institutions, and people involved in medical education to make decisions on the basis of the best evidence available;
- the production of systematic reviews of medical education, reflecting the best evidence available and meeting the needs of the user;
- the creation of a culture of best evidence medical education among teachers, institutions, and national bodies.

This organization produces systematic reviews of the educational literature, posts announcements of international education meetings, and publishes bibliographies on teaching and qualitative research. This is an “open-access” site, so there is no fee to access this wealth of information.

These resources pertain largely to medical education, career development, and adult learning. Other resources that might be of interest to clinicians on a course of self-study include education and psychology journals. The American Educational Research Association (AERA) (www.aera.net) publishes the journal *Educational Researcher*, which contains articles on education in general. Access to their site requires a membership fee, but many universities give faculty members free access to this journal.

The Educational Resources Information Center (ERIC) is “the world’s largest digital library of education literature.” It is available through a free site (www.eric.ed.gov) sponsored by the U.S. Department of Education, Institute of Education Sciences. The site offers a wealth of information, providing access to millions of journal articles and other education-related materials. By going through its website, you can learn how to perform searches and access information by clicking on the link “About the Eric Collection.” Unfortunately, much of the information is not peer reviewed and it is not as well indexed as Medline, so “buyer beware” is the order of the day. However, some of the material is very good. As your interest becomes focused on medical education, accessing this literature and these sites may be very useful.

Formal faculty development programs

A wide variety of formal faculty development programs that vary in location, length, cost, and focus of instruction have been developed. These courses are offered by professional societies (as mentioned earlier), universities and medical schools, libraries, private for-profit groups, and some community hospitals. A group from the BEME Collaboration reviewed the literature published between 1980 and 2002 on faculty development programs in medical education for effects on participants [29]. The majority of programs focused on practicing clinicians and, in general, did have a positive effect. Participants were highly satisfied, reporting gains in knowledge, skills, and attitudes, as well as positive self-reported or observed changes in teaching behaviors. Key features of effective faculty development programs are listed in Table 23.3.

The programs discussed first in this section are short, are known personally to the author, or have been recommended by other emergency physicians. Many of these offerings are superb in quality. See Appendix 23.1 for a partial listing.

The CORD sponsors an annual spring conference, the Academic Assembly (mentioned earlier), which is devoted to the education of faculty throughout their academic careers. The program has various offerings, divided into tracks for junior or senior faculty, new program

Table 23.3 Features of effective faculty development programs.

Use of experiential learning
Provision of feedback
Effective peer and colleague relationships
Well-designed interventions following good principles of instruction
Use of multiple methods of teaching and learning

Longer programs (more than 1 or 2 days) seem to be more effective.

Data from [29] Steinert Y, Mann K, Centeno A, et al. A systematic review of faculty development initiatives designed to improve teaching effectiveness in medical education: BEME, Guide No. 8. *Med Teach* 2006; 28: 497–526.

Appendix 23.1 Selected formal faculty development courses emphasizing teaching methods.

Name	Sponsoring organization	Contact information
Teaching fellowship	The American College of Emergency Physicians (ACEP) and Emergency Medicine Foundation	ACEP.org
Navigating the Academic Waters	Council of Residency Directors (CORD)	CORD.org
The Advanced Cardiac Life Support (ACLS) Course for Instructors	The American Heart Association	The American Heart Association
The Advanced Trauma Life Support (ATLS) Course for Instructors ^a	The American College of Surgeons	The American College of Surgeons
Emergency Department Strategies for Teaching Any Time (ED STAT!)	The Canadian Association of Emergency Physicians (CAEP)	http://caep.ca
The Harvard Macy Institute (HMI) Program for Educators in Health Professions	Harvard Macy Institute	www.harvardmacy.org

^aRecommendation by the course director of an ATLS course is required for admission to this course.

directors, and residency coordinators. The program always includes discussions on teaching from emergency medicine physicians who are nationally recognized for their skills in this area. Participants are encouraged to attend sessions they are interested in learning about rather than rigidly adhering to one track. Information about this program can be found on the CORD website, www.cordem.org.

SAEM hosts an annual spring meeting, which has some talks of interest to educators. It also sponsors interest groups and academies that submit educational proposals. There are a wide variety of offerings that range from information on didactic teaching to use of technology in teaching, bedside teaching, evaluation, and simulation. SAEM sponsors both interest groups and academies specifically designed to allow members with special interests to meet, exchange ideas, and put on didactic sessions related to their areas of interest. Some of these interests include evidence-based medicine, undergraduate teaching, ultrasound, and women in academic emergency medicine. These groups schedule meetings during the annual meeting, which are open to all participants. Innovations in Emergency Medical Education (IEME) is a venue of the annual meeting that allows educators to give oral or poster presentations on research they have done in medical education.

The Emergency Medicine Foundation and the ACEP sponsor the EMF/ACEP Teaching Fellowship. This is a 10-day course covering 2 weeks, one week in the fall and one week in the spring. Didactic and bedside teaching, curriculum design, career and leadership development, and evaluation are all taught. Participants are required to complete a scholarly project and present it in the second half of the fellowship. One of the most valuable portions is “microteaching,” in which participants’ performance is videotaped so that they can improve their didactic teaching techniques.

ED STAT! (Emergency Department Strategies for Teaching Any Time) is a program that was developed by several Canadian emergency physicians [30] and is now sponsored by the Canadian Association of Emergency Physicians (CAEP). The program focuses on various aspects of teaching. It is modular in concept and can be adapted to various settings for half-day or two-day sessions. ED STAT! speakers will bring the “road show” to a department on request, or physicians can attend a session in Canada. Further information can be found at the CAEP website (caep.ca).

The Harvard Macy Institute (HMI) offers a number of programs for health care professionals, including the Program for Educators in Health Professions. The goal of the program is to enhance the professional development of health care professionals as educators. There are five major themes: learning and teaching, curriculum, evaluation,

leadership, and information technology. Various educational formats are used, including large-group presentations, interactive exercises, problem-based learning, observations, reflective use of journals, and discussion in large and small groups. Fellows are asked to design and complete an educational project of their own choosing. The program consists of two sessions in residence at Harvard: an 11-day winter session and a 6-day spring session.

Fellowships in medical education share features that are designed to involve faculty members in a longitudinal set of faculty development activities with the goals of improving the participants teaching skills and creating a group of future educational leaders for the institution [31]. Frequently, these are nondegreed programs designed to increase the knowledge and skills of faculty members as teachers, educators, and leaders while they continue to work in institutional settings. Some programs offer university credit, a formal certificate, or a degree. Some are offered by departments of emergency medicine, while others are available from medical schools, many of which focus on teaching as well as the other skills needed by clinician–educators. A survey of medical schools showed that these programs vary widely in scope, mission, and duration, ranging from 2 to 36 months. Total contact varies considerably, from 2 to 584 h [32].

Many universities offer courses on education and now are beginning to offer degreed medical educational programs. For those wanting advanced degrees in education, the possibilities include a master's degree, a doctoral degree, and an education specialist degree. Faculty can use the Google search engine to find programs that provide on-site or distance education or a combination of the two instructional methods by using the string "degreed programs in medical education." Online instruction is a very attractive option because it eliminates the cost and inconvenience of travel and can often be accessed asynchronously. A recent library query found such programs at the University of Pittsburgh, the University of Iowa, the University of Illinois, and the University of New England. New programs continue to form; contact your library if you are interested.

Promotion

Many universities and medical schools are restructuring their promotion guidelines to allow clinicians (who are often not interested in obtaining tenure) to be promoted on non-tenure-tracks and on the basis of a combination of teaching, service, and scholarly activities rather than demanding large portfolios in research. The advantage of being placed on a non-tenure-track is that the emphasis is not on

research and obtaining funding from external grants. The disadvantage is that, in some universities, leadership positions and voting on key issues affecting the institution are restricted to tenured faculty. Still, the majority of medical schools have created promotion tracks that recognize and value the teaching, service, and scholarly activities of teaching clinicians. Clinicians are being promoted in ever increasing numbers on these tracks. It is imperative that faculty understand the promotion and tenure guidelines at their institution, because universities differ widely in how they interpret the meaning of scholarly activity and how they weigh teaching, service, and scholarship when reviewing a candidate's application for promotion. In any event, it is necessary to document teaching and scholarly activities carefully. An educator's portfolio is a tool that provides this documentation in a clear and detailed manner with an increasing number of institutions requiring submission of a portfolio at the time of application for promotion [33, 34]. Promotion requirements regarding publications have not changed in the sense that faculty members must have published in peer-reviewed journals to obtain promotion, but the type and quantity of articles needed by those seeking nontenured promotion has changed in many institutions.

Conclusions

Being a content expert is no longer sufficient for being recognized as a teaching clinician or clinician–educator. Becoming an expert in teaching requires the same thoughtful preparation and knowledge that any successful career demands. Expert medical teachers need content knowledge of medicine, knowledge about adult learning, and the desire to share what they know with others. There are multiple resources and methods available to faculty members to assist them to attain expertise in clinical and didactic teaching. In the future, teachers will be judged by their command of the competencies that deliver successful instruction. When institutions are faced with decreasing resources and competing budgetary needs, they will be inclined to allocate resources to programs that have supported the education of faculty members as clinician–educators and faculty members who are knowledgeable about educational principles and strategies. Expertise in teaching develops over a lifetime of practice and continued study of medical education.

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SECTION 5

Teaching Techniques and Strategies

CHAPTER 24

Strategies for effective clinical emergency department teaching

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Introduction

One unifying element of emergency medicine (EM) the world over is the busy, unpredictable, and physically constrained environment in which emergency physicians (EPs) practice and teach. Accordingly, the only practical teaching strategies are those that are both efficient and effective [1–4]. Few education studies have addressed the unique emergency department (ED) context. Adapting general ambulatory care models to the ED requires insight, thought, and concerted effort [5–7]. This chapter describes two models for ED teaching: a popular ambulatory model that can be adapted to the ED and another model derived specifically for ED teaching based on primary ED education research.

Strategies versus traits

Many studies of effective teachers address traits rather than behaviors [5, 6]. The literature identifies the following positive traits of effective teachers: approachability, enthusiasm, content expertise, good communication skills, sensitivity to different supervisory needs,

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and willingness to take the time to teach [5, 8, 9]. While most of these traits transcend cultural barriers, there are subtle variations, and success as a teacher ultimately depends on how these personal traits manifest in a locally relevant practice. But how does one use content expertise to get the most out of a teaching point? And how exactly does one take the time to teach when, seemingly, there is barely time for patient care? Good ED teachers recognize which of their strengths are conducive to effective teaching and actively adapt teaching strategies to both their environment and circumstances. From an international perspective, we recognize that EM is practiced in various physical plant settings, with different patient populations, learner groups, hierarchies, and teaching expectations. However, in the following sections, we detail a number of generalizable strategies for ED teaching and describe how they can be implemented using either of the two integrative models.

Models to guide emergency department teaching

Expert teachers and learners agree on what behaviors make good teachers [4, 10]. Just as there is an approach to acute trauma resuscitation or the workup of patients with dizziness, there is an approach to a teaching encounter. One popular approach to teaching clinical medicine in ambulatory teaching uses the microskills delineated by Neher and colleagues [7] (Table 24.1). The five steps of this approach have some applicability to the ED and are briefly described in the following sections. A second model, Emergency Department Strategies for Teaching Any Time (ED STAT!) [11] (Table 24.2), is based on primary ED research and is presented in detail in the remainder of the chapter. The models have significant overlap, and one or the other will appeal based on the teacher's perspective. Specific strategies to

Table 24.1 Neher's microskills.

- Get a commitment
- Probe for supporting evidence
- Teach general rules
- Reinforce what was done right
- Correct mistakes

Data from [7] Neher JO, Gordon KC, Meyer B, Stevens N. A five-step "microskills" model of clinical teaching. *J Am Board Fam Pract* 1992; 5: 419–424.

Table 24.2 The ED STAT! teaching model.

Expectations
Diagnose the learner
Setup
Teach
Assess and give feedback
Teach always (role model)

Data from [11] Sherbino J, Frank J, Lee C, Bandiera G. Evaluating "ED STAT!": a novel and effective faculty development program to improve emergency department teaching. *Acad Emerg Med* 2006; 13: 1062–1069.

implement the steps in both models are described later in this chapter, using examples from the literature, our own research, and our experiences. Strategies specific to Neher's microskills are presented during the discussion of that model; strategies specific to ED STAT! and those applicable to both models are presented with the ED STAT! discussion.

Neher's microskills

The first microskill, "get a commitment," involves encouraging learners to make a decision based on the information they have gathered. The commitment can relate to any aspect of the physician–patient interaction, from differential diagnosis to investigations and to disposition decisions. The ED is an ideal environment to implement this step, given its high volume and diversity of patients. The more advanced the learner, the more sophisticated the level of commitment can be. Success in this step requires a sound learning environment in which a learner can feel empowered and safe to make decisions. It is important to consider the power differential and cultural context when implementing this step. Some cultures (e.g., Chinese and other Southeast Asian cultures) emphasize reverence over personal perspective, which may place the learner in an uncomfortable situation. The patient and family might expect the advanced physician to make all decisions and direct care. Alternatively, in cultures in which depth of knowledge is valued (e.g., the Japanese culture), confident decision making on the part of the physician could be interpreted as confrontational. Good teachers recognize these cultural differences and adopt a facilitative, constructive approach that encourages the learner to take some risks in a safe environment through learner-centered discussions.

The second microskill, "probe for supporting evidence," involves asking learners why they made certain decisions. This questioning

creates a level of metacognition that allows learners to gain insights into their decision-making process and gives the teacher insight into learners' diagnostic reasoning. In the ED, learners are constantly faced with uncertainty. They value good teachers who know the key elements in a presentation that guide their decision making and are willing to explain this process.

The third microskill, "teach general rules," allows learners to apply lessons under various circumstances. An example from the ED is the adage that "the sudden onset of pain is a vascular catastrophe until proven otherwise."

The last two microskills, "reinforce what was done right" and "correct mistakes," relate to feedback. Good ED teachers provide contextual, frequent feedback that is related to specific actions rather than characteristics. They do not wait until the end of a shift or rotation to provide feedback, and they avoid the temptation to limit their feedback to generalities ("Great job today. Keep it up!").

ED STAT!

The ED STAT! model has two phases. The first involves setting expectations (E) and diagnosing the learner (D). When a teacher takes these critical steps while first interacting with a learner, they underpin both efficiency and effectiveness. When these steps are performed well, the remainder of the strategies can be implemented easily. The second phase frames each individual teaching encounter, involving a setup (S), a specific teaching point or principle (T), assessment or feedback (A), and role modeling through demonstration and clinical practice: the realization that one is always a teacher (T).

Expectations

Efficient teachers invest small amounts of time in getting to know learners and identifying their educational needs. With this information, they can choose high-impact material that will be remembered by learners for its utility and relevance. Learners' perceptions of the amount and quality of teaching are influenced positively by the relevance of the material presented to them and the perceived amount of effort the teacher spent adapting to the learner's needs. Discussing expectations takes about 5–10 min at the beginning of a shift. Good teachers view this as time well spent, leading to greater efficiencies later. Learners appreciate the interest, and teachers can follow up later by directing the learner to a specific patient problem the learner had identified as an educational need or by reviewing a key differential diagnosis the learner had mentioned as being a challenge.

Learners do not always know what is best for them. Teachers should play an active role in setting objectives. Setting expectations

includes consideration of objectives set by learners and their program, specific patients of interest to the learner, and points along the patient interview-synthesis-investigation-management spectrum where the learner typically encounters difficulty. Questions such as “What do you want to learn/see today?” or “What learning objectives do you have?” often fail to elicit objective responses from trainees who are eager to appear interested in everything. Questions such as those listed in the following are more likely to prompt tangible objectives:

- “What do you normally find challenging/interesting/difficult?”
- “What is on your wish list that you have yet to see?”
- “What feedback have you been given about areas to work on?”
- “What would you like me to provide feedback on today?”
- “What types of patients should I be on the lookout for today that you would like to see?”

Again, it is important to appreciate the perspective of the leaner. In some circumstances, acknowledgment of persisting learning needs can be perceived as an admission of failure. Learners should be reassured that setting expectations is in their best interest: “How will we know if we’ve accomplished any learning today?” or “I can’t involve you in the high-yield cases if I don’t know what they are!” It may be helpful to allow time to think about expectations by revisiting the questions part way through the shift or by forewarning learners about the need to define objectives in an orientation session or information package before the rotation. Expectations can evolve as the teacher and learner each become familiar with what the other has to offer. For example, as a learner masters certain content areas, new objectives need to be developed. Alternatively, experience in the ED may uncover unexpected areas of need. Learners should be exposed to specific patients and problems that they may not see elsewhere. EDs with specific mandates such as trauma, inner-city health, or community-based practice should encourage learners to take advantage of them.

EPs teaching in international settings must be innovative, especially when they are teaching in environments with limited technology and resources and with learners who need in-depth knowledge about a specific indigenous topic, for example, infectious diseases. Teachers should make their specific interests known to learners and devise objectives around them. For example, an EP with an interest in toxicology, trauma, or clinical epidemiology can impart significant and applicable knowledge on these topics to their students. Local constraints on medical practice must be acknowledged. The inability to provide certain types of care should not preclude teaching about them, as long as the local circumstances are placed in the context of national or international standards. Residents can be taught to

make the most of available resources while being introduced to practice expectations in more resource-intensive locales. With this approach, the learners can become adept in the use of currently available resources while also being prepared for future technologic advances. Physicians who teach in locales with resource constraints should recognize that education under these circumstances is a two-way street. Initiatives aimed at establishing international standards for EM goals and objectives should facilitate the selection of relevant educational expectations regardless of the setting [12]. Recent work has sought to establish which of the goals are suitable for specific time-limited teaching in the ED [13].

Expectations should be broader for advanced learners. Teaching, administrative issues, managerial skills, and risk management/quality improvement activities are fair objectives. When teaching advanced learners, it is often more difficult to establishing the appropriate amount of supervision. Helpful responses can be elicited by asking questions such as “How would you like me to be involved today?” “Should we share the teaching?” “What logistical issues frustrate you?” or “What cases are you comfortable handling on your own?”.

Some learners are self-directed and want to think through problems on their own using notes or web-based resources; others prefer to optimize their time with an “expert” to discuss an approach. Some respond well to guiding questions, while others see these as a frustrating “read-my-mind” challenge. Visual learners benefit more from reading than from hearing a lecture on a topic. Learners frequently lack the insight required to articulate these nuances at first, so teachers may need to revise their approach over time based on their experience. Asking guiding questions is not futile: it demonstrates your interest in the learner and highlights to them the need for self-insight.

Teachers should disclose their teaching habits to students. Learners are frustrated when different teachers have different expectations, especially when they feel they must “guess” what the teacher wants. Defining a preference clearly sends the message that the teacher understands the students’ perspective. Subsequent teaching will be more efficient because learners can adapt their presentations to the teacher’s expectations. For example, do you like learners to summarize the history taking, examination, differential diagnosis, and management plan or do you prefer that learners state up front what they think is going on so that you can probe their rationale through questioning? Do you like learners to review all patients before ordering investigations, or are you comfortable with them ordering basic investigations on their own? How many patients should they have “on the go” before coming to review them? The answers to these

questions will vary depending on learners' educational levels and your comfort with them.

Some learners benefit from stringent guidelines. Setting time limits on patient interactions, breaks, and departures from the department is important, especially for learners who are not organized and those who are unfamiliar with the ED. Learners often have difficulty understanding that ED assessments can be focused and would benefit from some clarity on your expectations regarding patient flow. In general, medical students and junior residents should focus on quality care for a small number of patients, and advanced residents can gain experience with streamlining and cognitive shortcuts.

Diagnosing the learner

A teacher's impression, or "diagnosis," of a learner is informed by the learner's strengths and limitations, the teacher's experience with the learner, and, in some cases, the knowledge about the learner's previous performance. The diagnosis represents the learner's cognitive and behavioral level and contributes to the decision regarding a course of action for advancing the learner's education. Obvious areas of concern or deficiencies should be noted by the teacher, and any behaviors that are causing significant concern should be identified. The teacher can then make a decision about how to interact with the learner, what should be taught, and what degree of autonomy is warranted.

Learners who are slow to decide on a disposition or overly conservative may be averse to risk. They should be encouraged to make decisions and commit to a course of action within the security of a supervised environment. Some learners are "minimizers" and others are "worriers." Teachers should adapt their vigilance accordingly. Learners may avoid certain patients because they reveal deficiencies in their skill set. They should be encouraged to face their limitations head-on, with guidance or tools being provided by the teacher. Some learners have specific deficits in core competencies, such as diagnostic reasoning, communication skills, teamwork ability, resource management, professionalism, or critical appraisal. Astute teachers will be vigilant for these deficits and will tailor their approach to address them through teaching and feedback. Learners should be aware of, and ideally agree with, the areas that need focus. Clearly, teachers who are effective at discussing expectations will have the least difficulty with learner diagnosis.

Setup

Learners often require sensitization to learning points or guidance around the approach to a specific patient. This can be accomplished

with a brief setup discussion. Careful setup teaches the learner what is important in a given presentation, provides specific guidelines relevant to a patient encounter, and alerts them to the teaching that will follow. For rudimentary or familiar presentations, many learners can engage patients appropriately on their own with little or no setup.

Setup may include medical decision making: "This patient has right upper-quadrant abdominal pain. What are the five most important diagnoses you are going to consider?" or "This patient has chest pain. I want you to bring the ECG to me within 5 minutes if it is anything but normal. Reducing time to acute MI treatment is one of the biggest impacts we can make in emergency medicine." or "This patient seems to have multiple complaints. Your job is to identify the principle complaint and the chronic problems and determine if any of them seems dangerous. Be clear with the patient about the conditions that we will and won't be able to address today."

In some cases, feedback provided for one case will set up the next. For example, if a student requires an inordinately long time to assess a straightforward ankle inversion, a teacher might use feedback about this to set up the next case: "I expect you to complete the history and examination in less than 15 minutes. If it seems it will take longer, I want you to come and tell me and then we'll figure out why." A habit of this type of difficulty could have been identified during discussions of expectations and would inform the teacher's diagnosis of the learner. Consistency through all phases of the teaching model can lead to very satisfying improvements in learner performance.

Some setup issues may pertain to departmental logistics: "Our ultrasound department closes in 30 minutes, so decide in the next 10 minutes if you think this patient will require an ultrasound. That's a patient flow tip I picked up a few years ago!" Still others may relate to key resources: "This pocket card is a clinical decision rule that I use for patients like this. Go see the patient, then have a look at it. Your job is to tell me if you think he satisfies the components of the rule." Sensitize the learner to some of these efficiency measures by framing them as learning or practice "tips."

Teach a focused teaching point

Excellent teachers do not necessarily teach the most. Rather, they teach high-yield material, relate it specifically to an individual learner, and make learning interactive and fun. Selecting an appropriate teaching point is an art. Good teaching points are (i) relevant to the learner (based on expectations, the learner's diagnosis, and possibly an appropriate setup), (ii) contextual (learned in the course of patient care), (iii) linked to knowledge (based on past encounters with the learner and the knowledge of his or her experiences), and (iv) clearly identified as

grounded in evidence, general opinion, or the teacher's experience. Thankfully, learners do not expect long, thorough reviews of topics in the ED. They appreciate helpful guidance around patient care, "rules of thumb," useful resources, correction of inaccuracies or deficiencies in their knowledge base, and useful approaches to problems [14]. Many good teaching points pertain to nonclinical issues such as good teaching practice, patient flow, or interprofessional relations.

Good teachers actively seek teaching opportunities. They listen to conversations learners have with each other and other health professionals. They read what learners chart and seek interesting laboratory and imaging results. They summon all learners in the department for a brief teaching encounter around a great case, modified to each learner's level. Good teachers have a repository of resources that they use to support a teaching point or address a learner's declared learning need; examples include a digital image library, a file of interesting ECGs or laboratory results, or favorite websites and practice guidelines. For advanced residents, involving them in administrative decisions, diverting nurses' queries to them, and having triage personnel notify them first about trauma or resuscitation cases all provide important opportunities.

Learners like to be challenged in a safe teaching environment. Success depends directly on proper learner diagnosis and preparing learners for the challenge by setting proper expectations. Rather than focusing on what learners already know or what they can read in a textbook, good teachers promote active learning in three key ways. First, they quickly push learners to the limit of their knowledge and take them to the next step but rarely beyond. Asking for innovative differentials is a good way to do this: "List six extraperitoneal causes of abdominal pain" or "What seven life-threatening thoracic injuries must be sought in the primary survey of a trauma patient?" Good teachers expand on a case: "Okay. It sounds like you know what to do with this patient, but how would that change if she were pregnant?" or "Do you know which patient population was used to derive and validate that decision rule?"

Learners appreciate flexibility in the approach to patients. It is essential that learners be forced to make decisions. As long as their proposal is safe, it is sometimes useful to allow them to carry out their plan even if it is not the teacher's first choice of action. The learner can then adapt his or her approach through an iterative process by seeing the consequences of decisions. At the very least, learners should be forced to make a commitment and justify their opinion before the teacher explains why a different course of action should be taken.

Effective teachers have strategies for busy times. They acknowledge that detailed teaching will be replaced with more concise case-based

teaching focused on learner needs. For example, if ECGs or radiographs have revealed an area of concern, then teaching can focus on any electrocardiographic or imaging studies that have been completed. Rather than teaching the approach to a patient who has had a decreased level of consciousness for 30–45 min, teachers can focus on laboratory results such as acid–base “rules” or a differential diagnosis for an elevated anion gap. The learner can then be referred to a textbook or a website to find an algorithm. The teacher can pose a “theme of the day” such as the differential diagnosis of headache. In available moments, the learner can be prompted for an addition to their list, and the teacher can commit to discussing the pertinent physical findings or investigations for every new item the learner adds. Finishing off the list can then become homework or a topic of discussion after the shift. Likewise, if a learner has difficulty deciding on investigations but has decent assessment skills, the teacher can quickly determine that the story is adequate (by either asking the learner some brief questions or going in to see the patient with the learner in tow) and then focus on teaching the investigations. For example, it would be more useful to focus on the limitations of ultrasound in diagnosing appendicitis than on the embryology of gut rotation and why the appendix is in the right lower quadrant. For a medical student, an introductory line might be, “Walk me through how you examined the abdomen. I’ve got a couple of tricks you may find useful. Then I’ll tell you how I investigate these problems.” For an advanced resident, the focus may be the following: “I talked briefly with the patient you saw, and I agree it sounds like it might be a pulmonary embolism. What do you know about the sensitivity of CT in the diagnosis?” Efficient teachers multitask by “teaching and doing” such as by “talking through” procedures for the benefit of learners.

Good teaching points can be overlooked. Simply telling a learner that the Ottawa ankle rule and where to find it is a useful 30-s teaching point. Going through the rule and its applications is quite another approach, taking perhaps 5 or 10 min. Good teachers recognize the difference between these two approaches and adapt their approach to the time available. Another quick example for the student who has difficulty organizing a differential diagnosis is to provide a mnemonic that they can use for all subsequent cases, and insist that they use it.

Finally, many excellent teachers make use of teaching scripts, described by Irby [14]. Teaching scripts are discrete packages of information that a teacher keeps in the back of his or her mind for common scenarios. Typically, the script is based on the teacher’s experience with other learners at a similar level and focuses on common areas of misconception or difficulty. The beauty of teaching scripts is that they are brief, targeted to common areas of need, and

easy to deliver because the teacher is familiar with them. They can be delivered with minimal preparation.

Assess and give feedback

Good teachers provide both ongoing and summative feedback to learners. Feedback given in the course of case review can be used to set up future cases: “The most important thing that you write in the chart is the discharge instructions. Please be specific about what you tell patients when they leave. I’ll be looking for this in the next few charts you do.” There is no better time to provide feedback about an incident than shortly after it has occurred, assuming the learner is receptive. In the rare situation in which a particularly stressful or negative event has occurred, feedback should be deferred. Learners should be given either guidance as they progress through the shift or, at the very least, a summary of feedback, including specific references to important incidents, both good and bad, that occurred that day. The use of shift feedback cards is a good way to stimulate and document feedback sessions. See Chapter 7 for a more thorough discussion of this important topic.

A teacher always: being a role model

Much of the learning that occurs in the ED is implicit: learners observe what teachers say and do. Learners are frustrated when teachers do something they advised against or if they omit an action that they told the learner is necessary. It is thus important that teachers hold themselves to a high standard and display the behaviors and professionalism they expect from students. Teachers should acknowledge when a statement is their opinion and not an unequivocal truth. Learners might have seen a different approach in the recent past and therefore be confused about contradictions in practice.

Learners must be skilled at identifying their limits. Teachers should also acknowledge when they do not know factual material or require additional expertise to manage a patient. This is seen by good teachers as an opportunity to team up with the learner to solve the problem: “You look here and I’ll look there and we’ll compare notes.” This can also be turned into a homework assignment: “Look this up and see what you find. I’ll do the same, and we’ll talk about it the next time we meet.” Teachers should demonstrate appropriate collaborative behavior with other health professionals and physician colleagues and acknowledge when circumstances lead to suboptimal interactions on busy or frustrating days. Teachers should acknowledge their own learning opportunities: “I learned something today” or “I’ll definitely do that differently next time!”

Summary

Multiple strategies for effective ED teaching are discussed in this chapter based on the five microskills delineated by Neher and colleagues and the ED STAT! model [7]. In the ED STAT! structure, the first two steps, that is, setting expectations and diagnosing the learner, taken upon the first meeting of the teacher and student, establish rapport and help develop an effective, efficient learning plan. The next steps are applicable to most teaching encounters: a setup, selection of a key teaching point, assessment, and feedback. Finally, teachers should do what they say and say what they do—they are always teaching through role modeling.

It is not necessary to change all teaching behaviors at once. Teaching can improve even with some incremental positive changes. Learners benefit most from teachers who have the learners' best interests in mind, are proactive, and are willing to change how they do things in pursuit of better learning and clinical care. In international settings, effective ED teaching requires adaptation to the specific learning environment, with regard to physical space, learner experiences, and sensitivity to cultural issues, in order to maximize teaching effectiveness. Despite its challenges, the teaching of EM can be intensely gratifying. The desire to share knowledge and expertise is a defining feature of our specialty. Our residencies are full of trainees eager to learn, and our responsibility to train them is enormous. We hope the pearls and pitfalls offered in this chapter will help you take advantage of the rich teaching environment in which we are privileged to practice.

Summary points

- 1 Be clear about your expectations and tell the learner how you like to review cases.
- 2 Form a "diagnosis" of the learner's needs, strengths, and liabilities based on your observations and discussions.
- 3 Set up each shift and patient interaction so the learner knows where to focus.
- 4 Focus teaching around key points and direct learners toward reference materials for a more comprehensive review.
- 5 Feedback, both positive and negative, is best given frequently and in the context of individual patient care.
- 6 Recognize the teacher's obligations as a role model. Make sure you embody what you teach.

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CHAPTER 25

Pearls and pitfalls in teaching: what works, what does not?

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Introduction

Writing a chapter that points out pitfalls without suggesting solutions would be akin to imposing endless criticism on a student without offering ways to improve. Therefore, the various pitfalls highlighted in this chapter are accompanied by suggestions for alternative approaches. Naturally, many of these suggestions reflect back on earlier chapters in this book, where strategies for successful teaching are presented more extensively. Much of what is discussed here applies to bedside teaching, but many of the principles transfer readily to lecture preparation, the scripting of medical simulations, and the demonstration of procedures. If you are looking for extensive literature reviews or in-depth debates over competing educational theories, better sources exist. This chapter, although borrowing from the medical literature, is born primarily of experience, observation, and reflection. Our own missteps in the teaching of emergency medicine have been a powerful source for understanding what works and what does not. Some may find it useful. Others may find it a starting point for discussion. Either will have served the chapter's purpose.

Before engaging in any discussion of teaching emergency medicine, the importance of clinical competence must be emphasized. Clinical excellence is a prerequisite for being a teacher and role model.

You must possess the clinical credibility to earn the respect of your students. Determining your own level of clinical competence requires that you assume the role of perpetual student: assess your strengths and weaknesses, seek feedback, and take the necessary steps to improve. In the end, we are all students engaged in the process of discovery and self-improvement.

Teach for the right reasons

Teaching is hard, requires preparation time, and rarely comes naturally. If you are teaching primarily for personal gain (e.g., promotion) and not viewing it altruistically, you may find its challenges intimidating. Your learners will quickly recognize your lack of enthusiasm for the task at hand, and your frustration at the workload will be apparent. Ideally, teaching is gratifying for you. To facilitate this, identify ways in which teaching enhances your own skills and judgment. Find opportunities to talk about what you know or to learn more about a topic that you would like to master. Many of us have an area about which we feel passionate or to which we have a connection. Use that passion as a springboard to develop your teaching points. Channel your enthusiasm for the topic into your presentation. Teach as if you care. You may find that personal gain, once de-emphasized, comes more easily.

Consider the powerful and direct effect your teaching has on patient care. Your knowledge and skills imparted to students today are propagated through their care delivered tomorrow and for years to come. You have the potential to affect countless lives with every clinical pearl offered. Viewed in this light, do you need a more compelling reason to teach?

Keep it simple

Long lectures and comprehensive reviews are not only tedious but also impractical for the emergency department (ED). Keep discussions and presentations focused on a specific problem, reinforcing your points with relevant background information only. Avoid attempting to convey too many concepts at once. This applies to lecture, bedside teaching, simulation, and any other teaching venue. Select two or three main points, avoid digressions, and repeat to promote retention. The same principles apply when demonstrating a procedure. Break it up into logical components (e.g., indications, landmarks, site prep, execution, troubleshooting), pause for clarification and reinforcement, and allow time for questions.

Clarify expectations

An effective way to define the teaching role is to establish your expectations for the learner. Well-defined goals, whether they are lecture objectives, your preferred format for receiving patient presentations, or specific tasks you would like to see accomplished, provide a constructive framework for teacher–student interactions and create a positive learning experience. Outline a few important areas on which the learners should focus. These will vary with the trainee’s level of experience. For newer trainees, offer guidance on identifying acute problems, sorting the dangerous from the benign, and recognizing what is germane to the ED. For more experienced trainees, emphasis may shift toward patient service concerns, instruction of junior residents, and departmental flow issues. These clarified expectations make evaluation and feedback more straightforward and give both learner and instructor a sense of progress.

Clarifying expectations is especially important for recently graduated faculty members who are now supervising former peers. They may find it difficult to establish boundaries and provide critical feedback. The crucial intellectual step required of all faculty is to recognize how the responsibility for a trainee’s education, and its impact on patient care, supersedes any desire to “be a pal.” By consistently taking a few moments at the beginning of each shift to set expectations, you will solidify the teacher–learner dynamic.

Learn what they need to learn

To create satisfying educational encounters, determine the needs of your audience. Whether teaching at the bedside, lecturing to a crowd, or presenting to a small group, solicit the learners’ goals and objectives to help you align them with your own. Assessing your learners’ needs will allow you to target your instruction, establish your topic’s relevance, and connect with your audience. You may consider showing how your topic will improve patient care, avoid lawsuits, increase efficiency, or, as a last resort, help pass the examination.

Addressing your audience’s goals and objectives is straightforward when groups have a shared level of expertise. Groups with varied levels of training demand a more thoughtful approach. The pitfall is teaching too narrowly. Aim too high and your audience will fail to engage your topic. Aim for the least common denominator and your audience will lose interest. A balanced presentation targets the objectives of your midrange learners and offers pearls to your experts, yet remains accessible to all.

Teach, do not taunt

We have all been subjected to that endless line of questioning that starts and ends with memorized medical facts, typically referred to as *pimping*. Although falling out of favor, it still deserves another kick to the door. The recitation of mere information provides the learner no opportunity for escape or improvement. Pimping promotes a learned helplessness, whereby if the answer is not known, the student is left without recourse. At best, factual questioning establishes that learners already know whatever facts on which you quiz them. Using this method, the most you could hope to contribute to their education is a few more facts, often at the expense of their self-esteem. If you are trying to gauge a learner's level of understanding, there may be a brief role for factual questioning, but it is otherwise a low-yield technique.

In place of pimping, challenge the learner with questions that demand a problem-solving approach. Use questions that target students' understanding of broad concepts, rather than mundane facts. Regurgitating Ranson's criteria is of little use if one does not understand the pathophysiology of pancreatitis. Questions focused on the underlying mechanisms of pancreatitis will prompt students to ponder the processes at work, providing a logical transition to treatment considerations. Students will move from being theoretical to practical independently, experiencing the power of the former to guide the latter. Emphasize understanding over memorization to promote the critical thinking skills that are so fundamental to emergency physicians.

Practice safe learning

A safe learning environment is paramount for learners to venture beyond their comfort zone. Establishing such a climate requires the same techniques by which we connect with patients. Provide your learner with undivided attention, make eye contact, and protect the encounter from interruption. This approach will let your students feel you are fully focused on them. Belittle your learners and fire snappy put-downs at wrong answers for the sake of a laugh, and you will rapidly develop an audience of passive listeners that fear humiliation and dare not speak up.

By inviting opinions, encouraging questions, and challenging conclusions, you will enhance your learners' ability to think broadly, stand by their reasoning, and make a commitment. A nonthreatening learning environment can also provide unforeseen benefits to patient care. Students may volunteer information you had not considered, altering the patient's management. Empowering providers at all levels to voice their thoughts is consistent with the growing emphasis on teamwork training and its impact on patient safety.

Engage your learners

Recognize that most adults learn via action, experience, and reflection rather than via the passive absorption of information. If ideal teaching is case based, clinically relevant, and experiential, then opportunities abound in the ED. Sign-out rounds, for example, include all these elements and provide extremely teachable moments. The physician leading sign-out rounds selects teaching points based on the educational benefit to the team and asks questions of the group to establish a collaborative learning approach. Sign-out gives trainees the opportunity to explain not only their management plans but also their decision-making process. This forces learners to use critical thinking skills, review their patients' management, and take an active role in educating their peers. Conducting sign-out rounds at the bedside can further activate learners by demonstrating physical examination findings and modeling communication skills.

Independent learning, such as researching a topic for a minilecture at the end of a shift, is another effective active learning strategy. Ideally, the topic stems from a clinical question that arose during the shift. Placing students in a teaching role forces them to define the question and present the information clearly. Many good structured case-based clinical teaching methods are described earlier in this book and elsewhere in the medical literature. Regardless of the method selected, their common value is the one-on-one exchange that occurs between teacher and student.

While lecture defies some basic principles of engaging learners, this format can be an effective way to convey information to a large group in a short time. The one-way flow of ideas, from lecturer to audience, can be improved when the material is case based and relevant to the audience's needs and when the presentation allows open discussion. Judiciously used, lectures can provide a basis from which other teaching methods can be implemented, including small-group discussions, simulation exercises, or procedural skill training. These techniques are examples of more active learning that engage students, facilitate questions, and provide the opportunity for timely feedback.

A little autonomy goes a long way

One of the greatest challenges for the academic physician is balancing patient care with the needs of trainees. A common pitfall is the inability to relinquish control. This may stem from a desire to maintain patient safety or departmental flow. As the shift becomes busier, the temptation to take over patient care directly and have the student

“learn by observation” becomes strong. The higher a patient’s acuity, and the less experienced the trainee, the harder it becomes to delegate decision-making responsibility. A student may be immersed in a comprehensive review of systems with a dyspneic patient while every fiber of your being silently screams for immediate “BiPap!” Clearly, patient safety is foremost and you will need to step in. But in other situations, the medical student can be tasked with deciding whether to order a complete blood count, the intern with whether a chest film is needed to assess a patient for pneumonia, and the senior resident with whether the patient in respiratory distress requires intubation. This graded approach can help you as the teacher becomes more comfortable with your trainees’ growing independence.

Let your trainees know that their response matters when you ask, “What do you want to do?” Some trainees will continually defer to you. Guide them with your knowledge, your experience, and the evidence available but resist the temptation to offer your opinion until they have committed to their own plan. This forces them to consider consequences and eventually increases their comfort with the decision-making role.

What are you thinking?

Conveying your thought process to students is the core of clinical teaching. Just as patients wish to know the reasons for their tests and treatments, so your students crave insight regarding your decisions. Whether based on core medical knowledge, key observations, pattern recognition, or recent evidence from the literature, your thought process is the most powerful mechanism for clinical teaching. Some educators “think out loud” while discussing a clinical case, which gives the student direct access to the differential diagnosis and an explanation for the management plan.

Another effective teaching method is to explain your decision-making process to the patient and student simultaneously. This saves time, includes patients in the discussion, and allows you to model communication skills. This can be a useful technique when you are uncertain as to the appropriate patient disposition or sense resistance from the patient regarding your plan. When students observe you summarize the case, outline the options, solicit the patient’s and family’s input, and reach a consensus plan, they will then see a complete physician in action. They will see not only the medical decisions being made but also a model for how to address clinical, psychosocial, follow-up, and liability issues all in one brief encounter.

Food for thought

Providing appropriate feedback may be the most difficult teaching task. Because most physicians feel uncomfortable offering it, they fall into the classic pitfalls of providing no feedback at all or simply the vague reassurance that a trainee is “performing at a level appropriate for his or her training.” This common criticism of medical education can be overcome with practice, but it requires a constructive framework.

At baseline, there must be a professional culture of understanding. Teachers must recognize their responsibility for students’ improvement. Viewed in this light, feedback becomes an expectation and a guide for professional development, not a judgment of character. Mature learners recognize this; those who become defensive on receiving such critiques may benefit from having this dynamic pointed out.

Clarify at the outset the criteria by which the student will be judged. Set the expectations early. In this way, feedback becomes part of a discussion already begun and feels less awkward. Selecting the appropriate time and place for providing feedback is important. The management phrase “Praise in public, criticize in private” applies here. Feedback should be delivered promptly so that events are fresh in the student’s mind and key points are relevant.

To begin a feedback session, ask the student for a self-assessment. In many cases, he or she will identify the same deficiencies you have, making the discussion easier. Keep the session on a professional level by referring to specific behaviors or actions that can be changed and by using nonjudgmental, descriptive terms. Students will be more receptive to negative feedback if it is balanced by noting their areas of strength. End each session on a positive note, with concrete suggestions that the student can implement to improve.

When giving feedback, do not overlook your strongest trainees. While it may feel easier to evaluate them with a pat on the back, they are as deserving of guidance as their peers. Even the highest performers have room to improve.

Conclusion

The practice of medicine is built on the passing down of knowledge from experienced clinicians to aspiring students at all levels. This custom is a defining feature of the profession, and nowhere is this process more evident than in emergency medicine. High patient

volumes, undifferentiated pathology, and supervision by knowledgeable teachers combine to create an environment rife with learning opportunities. Despite its challenges, teaching emergency medicine is intensely gratifying. Our residencies are filled with enthusiastic learners who will apply our teachings to thousands of patients throughout their careers. We hope the pearls and pitfalls offered in this chapter will help you avoid the mistakes we have all made and take advantage of the rich teaching environment in which we are privileged to practice.

Summary points

	What works	What does not
Teach for the right reasons	Teaching what you care about	Teaching for personal gain
Keep it simple	Problem-focused discussions	Information overload
Clarify expectations	Well-defined goals and objectives	Failing to establish roles
Learn what they need to learn	Assessing your learner's needs	Teaching too narrowly
Teach, do not taunt	Questions that foster problem solving	Humiliation, sarcasm, and intimidation
Practice safe learning	Soliciting students' opinions and questions	Emphasizing the academic hierarchy
Engage your learners	Engaging students, facilitating questions, providing feedback	Overuse of lecture format
A little autonomy goes a long way	Delegation of graded responsibility	Inability to relinquish control
What are you thinking?	Explaining your thought process	Giving answers, not explanations
Food for thought	Timely, objective feedback	Personal character judgment

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